THE BROADBAND STAKEHOLDER GROUP

REPORT AND STRATEGIC RECOMMENDATIONS

November 2001

Table of Contents

BROADBAND STAKEHOLDERS GROUP

REPORT AND STRATEGIC RECOMMENDATIONS

EXECUTIVE SUMMARY

The Broadband Stakeholder Group (BSG) is delighted to submit this report to the Minister of State for E-Commerce. We would like to thank all of the stakeholders who took part in the BSG's deliberations and who contributed to this work. In particular the chairmen of the four working groups made major contributions. We are also grateful to the Office of the e-Envoy for their support and facilitation of our work.

The government set the framework for the report by identifying its Broadband objective for UK 'to have the most extensive and competitive Broadband market in the G7 by 2005'. We compliment the government for setting this bold target. However, the UK has slipped behind its international competitors as measured by take-up of broadband by consumers and SMEs.

This report identifies a strategy and a set of recommendations to take the UK forward from its current unsatisfactory position on Broadband to achieve the Government's goals for the rollout and adoption of mass-market broadband by 2005.

This report recommends a number of very specific actions for government. In particular it:

1. Defines broadband, in terms of access to progressively higher bandwidths.

2. Provides a vision for 2010, which demonstrates why broadband matters to the UK.

3. Analyses the strengths and weaknesses of the UK concerning broadband roll out.

4. Establishes a set of principles to shape our recommendations.

5. Identifies a framework for a long-term strategy to take the UK from its current position to international leadership by 2005.

6. Develops recommendations for accelerating market driven deployment, and enabling public sector use, underpinned by regulatory measures.

7. Recommends next steps for the Broadband Stakeholder Group.

Definition

The BSG has developed a dynamic definition of Broadband that is technology neutral and focused towards the delivery of services to the end user, rather than particular bit rates. For the purpose of this report we define Broadband as follows:

'Always on access, at work, at home or on the move provided by a range of fixed line, wireless and satellite technologies to progressively higher bandwidths capable of supporting genuinely new and innovative interactive content, applications and services and the delivery of enhanced public services.'

Vision

Our vision is that by 2010 Broadband Access will have enabled Government to meet its objectives for competitiveness, e-government, digital TV, and the delivery of better public services.

In summary our objective is that Government and citizens will have benefited by the delivery of content rich interactive, and as a consequence, better government services. Quality of life for both urban and rural citizens will have improved though access to other non-governmental applications, services and content.

The creative media, software, and applications industries will have exploited this huge infrastructure upgrade to deliver new compelling forms of content – ranging from interactive games and TV programmes to educational packages and health care tools. The UK will have maintained its position as a world leader in e-commerce and will be exporting its technology, services and knowledge around the world.

The roll-out and take-up of Broadband will deliver significant benefits for the UK economy and presents a significant opportunity to improve investment, innovation, enterprise, competition and skills ahead of our competitors.

Strengths and Weaknesses

In brief the UK's key strengths include:

- High level of narrowband take up

- Relatively high levels of e-commerce

- The dominance of the English language in online activities

- Proven creativity skills

- Multiple modern communications infrastructures across a large proportion of the population

- A world-leading position in digital TV

Meanwhile the UK's weaknesses include:

- Low level of broadband awareness and take-up

- Comparatively high price of broadband and poor coverage outside urban areas

- Difficulties in obtaining capital for local access infrastructure investment [1]

- Lack of new broadband content and applications

We are convinced however that the UK is positioned to exploit opportunities presented by broadband, particularly if the government adopts our recommendations.

---

[1] Whilst capital costs have fallen for the economy as whole, the risk-weighted price of funds to the telecoms industry remains much higher than other utility type investments. In addition, institutions are reluctant to fund projects in this sector because of uncertainty and recent volatility

Principles

The following underlying principles have guided the development of this report and have been used to develop and test the strategic recommendations. These principles should provide a framework for all actions taken by government in pursuit of its objectives for Broadband.

1. Broadband services should be made available to as many UK citizens as possible

2. The Broadband strategy must demonstrate the UK's long-term commitment to building Broadband Britain

3. Government and public services must be major beneficiaries of Broadband

4. Because there is no single solution to increasing the roll-out, take up and use of Broadband services, we need a range of complementary initiatives

5. These solutions must be technology neutral (including Digital TV) and support long term sustainable business models throughout the value chain

6. Supply and demand issues will need to be addressed simultaneously

7. Easing the flow of capital and spreading the investment risk more widely must be key objectives

8. The strategy should make maximum use of the UK's strengths, including existing resources and infrastructure

9. We need a regulatory framework that supports the objectives for Broadband

10. The national strategy should provide a framework for complementary regional initiatives and actions

Strategy

The Broadband Stakeholders Group (BSG) has identified six key areas of consensus:

*   Broadband has enormous potential to benefit UK citizens and businesses alike.

*   Although the UK is not where it should be on some measures, it has significant strengths.

*   It is time to build on these strengths and create a positive climate for Broadband.

*   The success of Broadband will require progress at all levels of the value chain.

*   The key to that progress will be a competitive and innovative market.

*   Selective Government involvement will be essential to move the market forward faster.

Improving the availability and take-up of mass market Broadband is a long-distance race, not a sprint, particularly as success means Broadband must reach every corner of the UK. Any successful strategy must therefore build on the UK's fundamental long-term strategic strengths which are stated in an earlier section of this summary. The BSG therefore urges the Government to pursue a long-term strategy to:

- **Let the market flourish**
  Remove regulatory and other barriers wherever possible, ensure investment and innovation are encouraged, promote competition as the key objective of regulation, avoid technology or other distortions.

- **Put Broadband on the national agenda**
  Help citizens and businesses understand "Broadband" and what it offers, assist with training in how to use Broadband to create and consume services, ensure all schools have access to Broadband services.

- **Commit the public sector to Broadband**
  Businesses will move cautiously until critical mass is close to hand, whereas the public sector (at national, regional and local levels) can and should invest in putting public services online and ensuring Broadband access to public premises ahead of critical mass emerging.

- **Address the Digital Divide, while securing the Digital Dividend**
  Ensure Broadband is progressively more widely available (including at community locations), but encourage and then use the conspicuous success of Broadband in the areas of initial availability as the key tool for improving rollout.

Each of the 15 specific recommendations listed below will be important for helping the UK to meet the BSG's long-term vision for a broadband future. **However, as a priority the BSG has identified three key measures that will be essential to kick-start mass-market acceptance of Broadband in the short-term. These include:**

- Action to stimulate research into and development of Broadband content and applications to help drive future demand for Broadband.

- Fiscal measures to reduce the cost of Broadband hardware and/or access charges to consumers to improve the price-benefit equation for early Broadband adopters.

- Action to encourage the investment community to reopen the flow of investment capital for infrastructure deployment.

These measures would help to move the UK purposefully towards a critical mass of Broadband users and encourage the development of a UK-based Broadband content and applications sector. Provided that they are implemented in a way that is broad-based and technology neutral they should not adversely impact the long-term development of a fully competitive Broadband market.

The critical issue is that they need to be put in place very quickly to have the maximum impact. If that impact is achieved, it should be possible to remove them speedily as well, perhaps within a couple of years, and then let the market flourish. The UK's fundamental long-term strategic advantages should then ensure the UK is able to stay at the forefront of the Broadband race through to the finishing line.

Recommendations

Based on the analysis of the current state of play and the UK's relative strengths and weaknesses the BSG has developed a framework of 15 strategic recommendations to meet these objectives. These recommendations aim to accelerate market and public sector driven deployment and use and include demand, supply and regulatory measures.

Accelerating Market Driven Deployment and Take Up

1. Implement supply side infrastructure support to reduce cost of capital
2. Encourage infrastructure sharing to reduce the need for capital
3. Promote increased competition in the BT Local Loop
4. Promote Broadband interconnection
5. Stimulate the supply of Broadband content, applications and services
6. Tackle skills needs for Broadband development
7. Introduce quality of service measures
8. Raise awareness and promote the benefits of Broadband to consumers and SMEs
9. Introduce demand side fiscal incentives to accelerate take up

Enabling Public Sector Driven Deployment and Use

10. Aggregate public sector demand for Broadband
11. Facilitate public access to Broadband facilities
12. Maximise efficiency and productivity gains in public services
13. Facilitate access to Broadband public services

Ensuring Appropriate Regulation

14. Enable a stable and predictable regulatory framework
15. Remove and prevent regulatory barriers to investment

More graphically these can be summarised as follows:

	Accelerating market driven deployment and use	Enabling public sector driven deployment and use
Supply	• **Extend Infrastructure** • **Develop Content and Applications**	• **Aggregate Public Sector Demand** • **Facilitate Access**
Demand	• **Raise Awareness** • **Provide Demand Incentives**	• **Exploit Public Service Benefits**
Regulatory	• **Ensure Supportive Regulatory Structure**	

Next steps

As requested in UK Online: the Broadband Future, the BSG's remit after submission of the initial recommendations will be to keep the strategy under regular review offering recommendations to government on how it should be updated on a six monthly basis.

We look forward to the government's response to this report and will work together with the government to develop a road map to achieve the BSG's vision for Broadband Britain.

As the market develops the barriers and opportunities may well change. The BSG will therefore continue to review these issues and evaluate the UK's progress.

In particular the BSG has been struck by the lack of consumer based market research on the barriers to and drivers of Broadband take-up, and would encourage further research in this area.

Further work is also required to identify practical ways to take the development of Broadband content forward. The summit on Broadband content planned for 3 December 2001 will be useful in this regard.

In conclusion we urge HMG to adopt our recommendations in full and to seize the opportunities presented. We look forward to working with the government in the implementation of this report.

1.   INTRODUCTION

Background

In February 2001 the government published 'UK online: the Broadband future' an action plan to facilitate the rollout of Broadband services in the UK and set a goal for the UK: to have the most extensive and competitive Broadband market in the G7 by 2005. The report stated that government should develop and implement a strategy for meeting these goals in close consultation with key players in the public and private sectors, in particular by establishing a Broadband Stakeholder Group (BSG).

The BSG was convened in April 2001 and work was divided up amongst four task groups: 1) Competition and Co-operation; 2) Content and Demand Generation; 3) Catalysing Deployment for Public and Private Sectors; and 4) Research[2]. These groups presented their interim conclusions in September and their analysis and recommendations provide the basis for this first full report of the Broadband Stakeholders Group, which sets out a series of strategic recommendations for the UK Broadband Strategy. The BSG is will continue to work with and advise government on the development and implementation of a strategy for the rollout and full exploitation of Broadband services across the UK.[3]

What is Broadband?

One of the problems in discussing Broadband is the lack of a widely agreed definition. For the purpose of this report and the subsequent development a UK Broadband Strategy, the Broadband Stakeholder Group has sought to develop a dynamic definition of Broadband that is technology neutral and focused towards the delivery of services to the end user, rather than particular bit rates. For the purpose of this report we have also sought to include particular reference to the importance of Broadband to the future of the UK's public services.

BSG Broadband Definition:

'Always on access, at work, at home or on the move provided by a range of fixed line, wireless and satellite technologies to progressively higher bandwidths capable of supporting genuinely new and innovative interactive content, applications and services and the delivery of enhanced public services.'[4]

Broadband in context

The slow pace of the rollout of mass-market Broadband to SMEs and residential users in the UK has attracted considerable attention over the last 18 months. Cable modems and DSL are the main technologies currently being rolled out, but progress has been slow and concerns remain that prices are too high to achieve mass market take up. Local Loop Unbundling has so far failed to lead to significant competition in the Broadband access market, while the rollout of cable modems is only just starting to pick up. Users, operators, service providers, equipment vendors,

---

[2] The reports of the four task groups (which can be found in the Appendix) provide additional detail and should be read in conjunction with this report.

[3] The members of the BSG have developed this report on a consensus basis. In some instances, it may not necessarily reflect the detailed views of all of the participants.

[4] As a starting point this would include higher bandwidth services (defined as >256 Kbit/s by the OECD - the BSG recommends using OECD's definition in order to allow international comparability) but anticipates progressive development through to next generations of Broadband.

commentators and government have all shared a sense of frustration at the slow pace of Broadband deployment.

Nevertheless, it would be misleading to characterise the problem as either being UK specific or simply one of supply. Global market conditions and questions concerning the strength of demand have both contributed to the current situation.

The majority of worldwide Broadband initiatives have slowed down or stalled for a variety of reasons. Some are continuing (US, Japan, South Korea, Sweden, Canada, Germany, Belgium etc), although the pace is slower than was envisaged a year ago. In most of these cases government initiatives provide a stimulus in one form or another. However, new competitors have atrophied in many markets, while rollout to rural and less dense urban areas has not been addressed.

Meanwhile the 'killer application' that will drive demand has yet to materialise, instead Broadband currently offers better/ faster access to the content and applications, currently available on the narrowband internet. However, ISPs are receiving a significant volume of inquiries about Broadband services, particularly from users of unmetered services.

Nevertheless, Broadband remains a key factor for international competitiveness. Most national governments have Broadband initiatives and the UK is in global competition with other nations for capital and resources to fund large scale investment in Broadband infrastructure, content, applications and services.

The benefits of broadband and the importance of content for reaching mass market
It is widely agreed that currently the key benefits of Broadband for consumers (and therefore main drivers of demand) are:

1) speed,
2) always on,
3) unmetered access (although unmetered narrowband is also available in the UK)

In the absence of new compelling 'mass market' Broadband content and applications these will remain the key benefits that will drive Broadband take up. Yet these are significant drivers for both 'early adopters', the first 10% of users to adopt broadband and 'market makers', the next 20% of users who will be needed to reach the mass market take off point. (see Figure 1). Broadband makes current narrowband internet content easy to use, quick and interesting with initial market research suggesting that Broadband users find their on-line experience more efficient, concentrated and generally more rewarding.

New compelling Broadband content is likely to be increasingly available once a significant user base consisting of early adopters and market makers has been achieved.
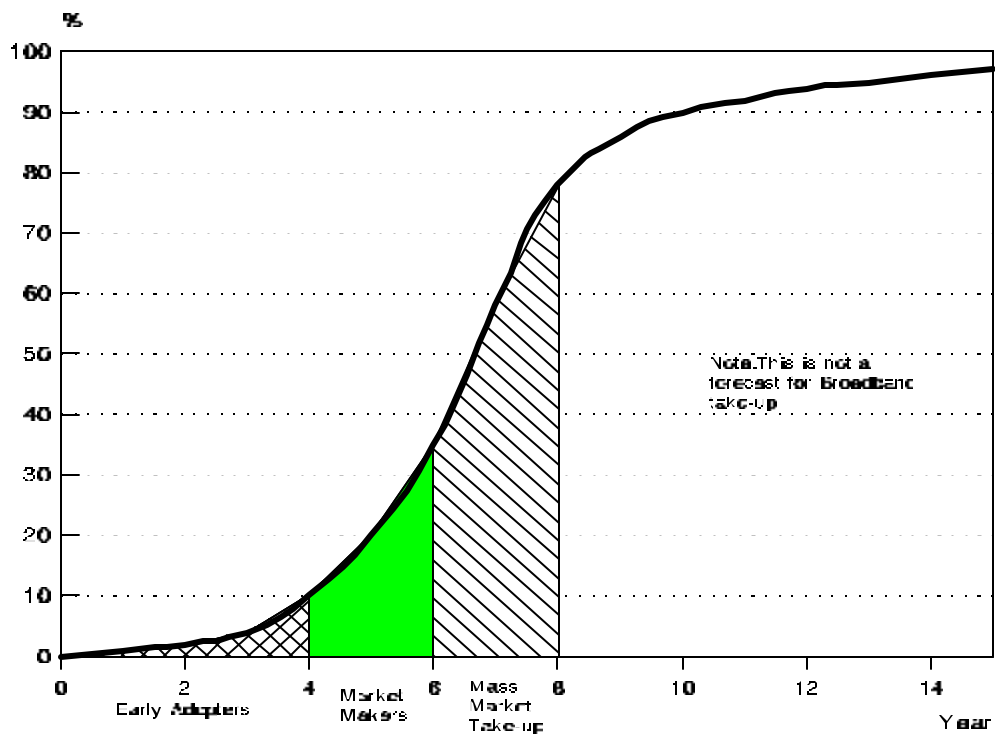
Figure 1: An illustrative adoption curve

Based on this illustrative adoption curve, the key challenge for government and industry is to unlock the virtuous circle described below in order to move up the curve as quickly as possible.

1. Encourage 'early adopters' and 'market makers' to upgrade to Broadband.

Increase narrowband Internet access

2. Establish a critical mass of market makers to encourage the development of new Broadband content and applications

3. New compelling content will then drive demand for Broadband

Figure 2: Building the Broadband virtuous circle.

BSG - Key Principles

The BSG has identified a number of underlying principles which have guided the development of this report and which have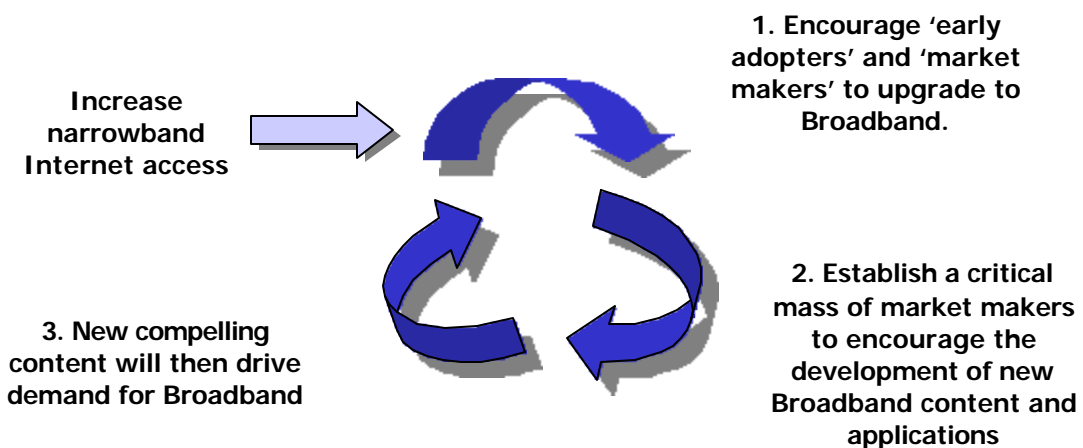 been used to develop and test the strategic recommendations set out in Chapter 4. These principles should provide a framework for all actions taken by government in pursuit of its objectives for Broadband.

---

10 Key Principles

1. **Broadband services should be made available to as many UK citizens as possible**

2. **The Broadband strategy must demonstrate the UK's long-term commitment to building Broadband Britain**

3. **Government must be a major beneficiary of Broadband**

4. **There is no single solution to increasing the roll-out, take up and use of Broadband services. We need a range of complementary initiatives**

5. **These solutions must be technology neutral (including Digital TV) and support long term sustainable business models throughout the value chain**

6. **Supply and demand issues will need to be addressed simultaneously**

7. **Easing the flow of capital and spreading the investment risk more widely must be key objectives[5]**

8. **The strategy should make maximum use of the UK's strengths, including existing resources and infrastructure**

9. **We need a regulatory framework that supports the objectives for Broadband**

10. **The national strategy should provide a framework for complementary regional initiatives and actions**

---

[5] Whilst capital costs have fallen for the economy as whole, the risk-weighted price of funds to the telecoms industry remains much higher than other utility type investments. In addition, institutions are reluctant to fund projects in this sector because of uncertainty and recent volatility

2. WHY BROADBAND BRITAIN MATTERS

2.1 A Vision for 2010

The vision of the Broadband Stakeholders Group is that by 2010, Government objectives for competitiveness, e-government, digital TV, and the delivery of public services will have been met. These objectives will all have been enabled, to a great extent, by Broadband access. Specifically by 2010:

> *"As a result of concerted action on the part of all of the Broadband Stakeholders, ubiquitous Broadband access will have been achieved in the United Kingdom. Using a mix of technologies suited to different locations and needs, most UK citizens will be able to access Broadband services, whether at home, at work or on the move. Meanwhile, as a result of the successful Digital TV Action Plan, 98% of the population will have migrated to digital and the analogue TV service will be about to be switched off.*
>
> *Government and citizens will have benefited by the delivery of content rich interactive government services. Quality of life for both urban and rural citizens will have improved though access to other non-governmental applications, services and content.*
>
> *The creative media, software, and applications industries will have exploited this huge infrastructure upgrade to deliver new compelling forms of content – ranging from interactive games and TV programmes to educational packages and health care tools. The UK will have maintained its position as a world leader in e-commerce and will be exporting its technology, services and knowledge around the world.*
>
> *Meanwhile, despite fierce competition, access to high quality communications infrastructure, skills and a technology literate population will have allowed the UK to remain the most popular destination for Foreign Direct Investment in the enlarged European Union.*
>
> *Finally, with the business case for Broadband proven, communications companies will be completing the roll out of fibre to the home and other very high bandwidth technologies to ensure that the UK maintains its leadership position in Broadband communications."*

Meeting the vision

The BSG will work together with government to develop and implement a route map to achieve this vision, highlighting the major milestones that will need to be reached en-route including the government's goal of achieving the most competitive and extensive market for Broadband in the G7 by 2005.

2.2   The Economic Case

Broadband represents a major transformation in the UK's communications infrastructure and perhaps the most significant change since the achievement of universal telephony. The economic benefits to the UK of Broadband will be significant. Many of these benefits have been glimpsed with the widespread take-up of the narrowband Internet. Broadband represents an evolutionary step forward in terms of infrastructure deployment, however, the powerful capacity that it delivers will eventually lead to a revolutionary change in the content, applications and services that the Broadband internet supports and delivers.

The economic case for Broadband and its significance can be put into context by looking back on similar capacity and capability changes in our national infrastructure – rail, road, electricity and telecommunications. Each of these transformed economic activity for firms and citizens, enabled new activities to develop, providing the nation with competitive and comparative advantages. Crucially, however, many of these benefits were unforeseen when the original infrastructure investments were made, yet today it is difficult to conceive how our economy would function in their absence.

For this reason, many of the nations leading the world in Broadband deployment – Canada, Korea are key examples – have not produced any rigorous *ex ante* economic case for their development strategies. The BBSG approach is to describe the framework within which economic effects arise, and identify the direction and expected magnitude of change that comprise economic benefits.

Challenges of modelling the economic impact

Economic benefits typically emerge as the aggregation of individual efficiencies, innovation and new wealth creation at the micro level. Economists have only just begun to model the economic effects of the wide scale deployment of ICT in the economy and its impact on ICT using growth accounting methodologies (for example see, Oulton, Bosworth and Triplett, the US Council of Economic Advisors to the President, Jorgenson etc)[6]. While there is contention about the level and extent of these effects, few economists doubt that Broadband will have a positive impact. The way that the economic effects of Broadband manifest themselves is illustrated in Figure 4 on the following page.

To explain Figure 4, increased spending on infrastructure, ICT equipment and the development of applications and content for Broadband all increase aggregate levels of investment, which flows through to GDP. Similarly, Broadband applications enhance competition in key markets by increasing the level of information available to participants and increasing market efficiencies; closer coupling within supply chains leading to higher capacity utilisation and higher quality output. Each constituent element, of which there is considerable anecdotal evidence, aggregates as a critical driver of economic growth.

---

[6] **Bosworth, B P and Triplett, J E (2000),** 'What's new about the new economy? IT, economic growth and productivity', *mime*o, Brookings Institution.

Council of Economic Advisers (2001), *Economic Report of the President,* US Government Printing Office: Washington, DC.

Jorgenson, D W (2001), 'Information technology and the US economy', *American Economic Revie*w, Vol. 91 (March), pages 1-32.

Oulton, N (2001) 'ICT and productivity growth in the United Kingdom' *Bank of England Working Paper 140*, Bank of England, London
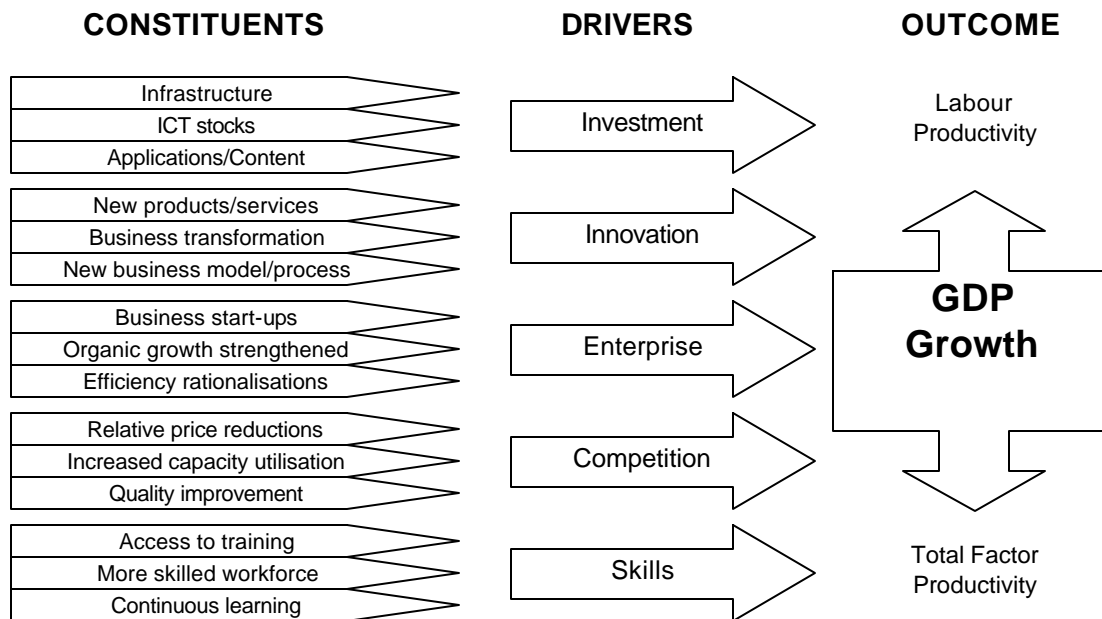
Figure 4: Key drivers for GDP growth

Anecdotal evidence

Economic modelling is challenging because each constituent influence is difficult, if not impossible to identify *ex ante*. However, a large volume of anecdotal evidence can be assembled which illustrate the benefits of ICT investment and enhanced networks. Some of these are included for reference below.

Driver	Example
ENTERPRISE	• **Cutting transaction costs:** Some of the most obvious and tangible benefits are those that eliminate cost. Recent e-Commerce developments show particular benefits in terms of eliminating transactions and intermediaries: in the travel sector, direct internet bookings to carriers combined with ticketless travel arrangements mean an average transaction administrative cost of sale was reduced from around £9 per ticket to less than £0.20. Multiplied by the millions of transactions across all travel modes, the cost savings and productivity boost is potentially hundreds of millions per year. The application of Broadband to these transactions enables them to be used more effectively to deliver more information more quickly. • **Increased efficiency savings – time, cutting travel needs, teleworking etc:** Broadband as a service also enables people to work effectively anywhere, by providing high speed access to corporate applications and information. This enables expensive office overheads and travel to be reduced through home working or through use of lower cost locations, with workforce interaction maintained through video communication. Another significant benefit is the reduction of unproductive travel and commuting time. Combined across the UK, this shift would eliminate significant in costs and improve labour productivity.

INNOVATION	• **Providing affordable and supportable software solutions for SMEs:** As mentioned above, software as a service will be a major business application enabled by Broadband. These services will provide powerful applications in such fields as customer relationship management, HR systems and enterprise integration to small businesses, providing them with the tools currently available to larger enterprises and linking them into supply chains. For example, the typical 'corner shop' can potentially participate in inventory management and participate in aggregate buying power, with commensurate savings, competing with the larger chains while maintaining local convenience. • **Driving innovation in the service sector – a source for real growth:** Accelerated roll out of Broadband will drive innovation in the UK. As in prior technological revolutions, the mere availability of, or access to the technological advance, is a crucial element to sustained invention and productivity growth. It is in the service sector where the real 'revolutionary' benefits of Broadband will be most apparent. With English as the lingua franca of the internet, and UK expertise in creative media, the UK is extraordinarily well placed to take full advantage of the potential for growth offered by Broadband.
COMPETITION	• **International competitiveness:** Many international companies are now looking to provide increased flexibility for their employees and to utilise teleworking in their organisations. Following 11 September 2001, teleworking is also likely to be increasingly important in contingency planning for major corporations. A Broadband infrastructure capable of supporting efficient teleworking will therefore be increasingly important for attracting multi-national companies to locate in the UK.
INVESTMENT	• **Potential to spread the benefits widely to rural and remote areas:** Broadband, if successfully deployed offers a real opportunity to reduce regional imbalances in the UK economy. If the necessary infrastructure investments can be made, the more regional and rural parts of the UK will be able to participate in equal measure in the Broadband economy. However, extending the reach of Broadband infrastructures is one of the most challenging issues addressed in this report.
SKILLS	• **Education and Training:** In order to compete with other leading economies the UK needs a highly skilled workforce that is proficient with the most up-to-date communications technology available. Children are likely to grasp the possibilities of Broadband more quickly than adults and will be the innovators of the future developing new ideas for applications and services and the use of bandwidth.

Broadband will be particularly beneficial for SMEs enabling them to benefit from access to many applications which were hitherto only within the resources of large firms. However, the economic benefits of Broadband will not be restricted simply to the private sector. Public services can also benefit.

Public Services
In the field of education, there are clear opportunities for the application of Broadband to cut costs and improve productivity and educational outcomes. According to the recent data collected in the United States, 68 per cent of teachers and 39 per cent of parents believe the use of a Broadband network to access educational material has had a beneficial impact on their children's education. The introduction of Broadband to UK schools, libraries, further education colleges and universities will vastly improve the variety and quality of educational material accessible to teachers and pupils alike and enhance the learning experience, bringing many diverse aspects of the outside world into the classroom. Children are likely to grasp the possibilities of Broadband more quickly than adults are will be the innovators of the future developing new ideas for applications and services.

In the Health Sector, 'teleconsulting' of ailments such as diabetes (which affects 2-3% of the population but leads to around 10% of hospitalisations) has potential to save over £200 million per year. A Finnish study using electronic referral (e.g. e-mail with attachments, including images) and electronic consulting (video conferencing) has been running for 9 years and reported for a PCG[7] sized unit in 1998. Outpatient referrals fell to $^1/_3$ their original value, the number of consulting sessions rose by 20% and overall costs fell by 20%. Surgical OPD[8] was little affected.

A recent study estimates that teleconsulting between GP's & consultants would reduce the acute outpatient loading at local hospitals by 5%, with an additional 5% gained if extended to include consulting based on high quality images, with a further 5% gain if an examination took place at the surgery.

In another example using Broadband to distribute medical imaging, the time to load patient information fell from 4.5 minutes to 7 seconds, liberating 2.5-3 hours of scanning time per day. Productivity of CT technologists was increased by 45% using electronic storage.

A study on searches for film showed that electronic storage cut the time a houseman or SHO spent gathering film for a ward round fell from 1 hr 40 mins to 22 mins. Other data: Number of doctors reporting lost in-patient images fell from ~55% to ~15% and the number of doctors ordering at least one re-scan per month fell from almost 40% to 12%.

Broadband can also make scarce resources available more widely (particularly geographically) in the health service. Recently the media drew attention to the possibilities of remote, robotic surgery using Broadband links, so a skilled surgeon in one location can perform more operations without delays through travel.

These are but a few of the many examples that exist or are conceivable using Broadband; it is likely the really important applications have yet to be conceived. Individually, their economic benefits may be quite small, and the productivity outcomes possibly marginal. But it is easy to see how, once aggregated, each such example will yield a substantial economic benefit to the UK (see below). More importantly, by aggressively pursuing these types of opportunities, the UK is much better placed to secure a competitive advantage in leading the deployment of these systems in the rest of the world.

Economy-wide estimates

It is possible to aggregate these benefits in a form that does indicate economy-wide effects. First, at the abstract level, both costs and benefits arising from Broadband can be identified. For example, costs might include:

o   Investment in Infrastructure
o   Skills and retraining
o   New regulations
o   Restructuring of business organisation and processes which may also mean displacement of industries/sectors, obsolescence of some skills
o   More imports e.g. computer hardware
o   Welfare losses if say the distribution of income widens
o   Security provision

---

[7] PCG: Patient Care Group
[8] OPD: Outpatient Deperament

Benefits might include:
o Ability to move transfer huge amounts of data leads to better and quicker decision making e.g. supply chain, customer relations, research, and teaching
o Increased linkages which facilitates communications bringing together more businesses, public authorities and households
o Greater output and greater choice for producers and consumers
o Increased labour productivity and international competitiveness
o Increased exports e.g. services
o Increased welfare for households and equity for producers
o Environmental gains e.g. savings on physical resources and lower emissions

The following chart provides an indication of the potential direction and impact of Broadband development on a twelve-sector representation of the UK economy, with shares of Gross Value Added for each sector based on the 1999 Input-Output Tables. Even acknowledging the degree of subjective judgement in ordinal estimates of impact, it is difficult to ignore the obvious conclusion this analysis suggests, that Broadband will have an overwhelmingly positive impact on the UK.

Calculation based on Gross Value Added (current prices)			Significance of Broadband
	% share of total output in 1999	% growth of sector since 1992	
1. ICT industries	7.0	84.6	Infrastructure investment, application development, new businesses
2. Business services, media, R&D	13.2	82.8	Content creation; ready access to and sharing of huge quantities of data between several locations
3. Public Administration	5.0	1.5	Enhanced policy making process, improved communications between departments, agencies, and public,
4. Health care & Life sciences	5.5	42.3	Better diagnosis, more rapid technical advance and diffusion.
5. Education	5.6	49.6	Access to a wider range of material and improved monitoring of student progress
6. Financial intermediation	12.3	44.5	Improved data visualisation, and customer service
7. Wholesale & retail trade	15.3	57.8	Facilitated e-sales and supply chain management
8. Transport	6.8	50.0	Enhanced potential for tracking of freight and vehicles: better travel information
9. Oil & gas, chemicals, mining, utilities	6.4	20.6	Data analysis, better balancing of supply and demand
10. Manufacturing & Agriculture	14.3	25.5	Sharper supply chain management, improved product design.
11. Construction	5.2	37.0	Better design, and coordinated deliveries
12. Other services	3.4	75.0	Improved client/customer care through enhanced communications, monitoring and surveillance
Whole economy	**100.0**	**45.5**	

Figure 5: Potential significance of Broadband for the UK economy

In addition to these sectors, households also benefit; for example, through new services covering education and health, home management, maintenance, fuel and light, physical security, news and entertainment, shopping and travel, financial services, civic responsibilities, public service access, employment, teleworking. Benefits arising in these areas will manifest themselves in terms of greater choice, lower prices, improved access, better quality, and more responsive services.

2.3   What Happens If We Do Nothing - The Implications of Inaction

Broadband can be rolled out without concerted government action, however it will take longer than previously anticipated and roll-out will be restricted to areas of high population density where aggregate demand is highest. The Government would fail to meet its objective 'to have the most competitive and extensive Broadband market in the G7 by 2005' and the UK would continue to fall behind its leading competitors. Given that today we are tenth in terms of Broadband deployment out of the eleven countries against which the BSG has measured the UK, this would have serious implications for the UK's competitiveness.

Costs of inaction
Delay in the rollout and take up of Broadband will mean that the main economic benefits outlined above will be lost. The opportunity to improve investment, innovation, enterprise, competition and skills ahead of our competitors will have been missed and the UK will have failed to take advantage of its early success in driving narrowband access and e-commerce.

The UK will no longer be able to claim a leading edge communications infrastructure making it increasingly difficult to attract inward investment. Public services will not benefit in terms of either efficiency or effectiveness. Significant opportunities for innovation and growth in the service sector will fail to materialise. Meanwhile the UK's content and application industries will fail to develop to their full potential. The UK will have missed its chance to capitalise on its 'unfair' advantage – the English language and the development of English language content will simply migrates overseas.

Meanwhile the Digital divide will become manifest. People living in rural or more remote areas will become increasingly aware of the services available in more urban areas, leading to political pressure for action. Government will therefore eventually have to act to fill these gaps, either by directly funding infrastructure investment or by seeking to influence the market through regulation. One lesson of Local Loop Unbundling (LLU) has been that sudden changes to the regulatory model are difficult to implement and can have serious implications for the business models of existing operators.

The need for strategic action
While the scenario outlined above may seem excessively negative, it highlights the fact that Broadband is at the heart of many Government objectives, including:

- Competitiveness
- Knowledge economy
- Education
- Health
- e-Commerce

The potential threats involved if the UK falls behind its global competitors are real and Government has recognised the need to plan ahead. If concerted measures such as outlined in Section 3 are not taken now, the need for action will only have been postponed, as the threat to the UK's competitiveness will remain.

Government must continue to work in partnership with all Broadband Stakeholders to deliver Broadband Britain.

3.   THE CURRENT STATE OF PLAY

3.1   Summary

- Approximately 60% of the UK population is currently covered by a mass market, terrestrial Broadband solution (DSL or Cable). Wireless and satellite solutions have yet to make a significant impact on the market.

- Although there is very little competition in the wholesale DSL market, more than 100 companies are offering DSL at the retail level. Meanwhile 66% of those with access to Broadband have a choice between cable and DSL services.

- Despite these levels of coverage and competition, take-up of Broadband services remains low – as of mid November 2001 there were 257,000 'mass market' Broadband lines in the UK[9], however the UK was still placed last in the G7 according to August figures. However, growth in take-up is accelerating, growing 450% in just 10 months from Dec 2000.

- Based on our extensiveness index, which combines service coverage and addressable market into a single index for each country, the UK is currently ranked in 5th place in the G7 (see section 5).

- Based on our competitiveness index, which combines regulation, choice and price, the UK is currently in 4th place in the G7 (see section 5).

Concerted action is required on the part of government and industry to improve the UK's position on all of the above indicators.

3.2   Measuring The UK Position Against The Government's Objectives

The government's goal is for the UK to have the most extensive and competitive market for Broadband in the G7 by 2005. The BSG was asked for advice on developing the key metrics necessary to track the UK's progress towards meeting this goal. Detailed proposals for measuring progress are set out in Chapter 5. This section draws on this methodology to assess the UK's position on:

- Broadband market competitiveness

- Broadband market extensiveness

In addition the BSG believes that take-up of Broadband should be tacked as the single most important indicator of success for the UK's Broadband strategy. At present the UK is in seventh position in the G7 for take-up.

---

[9] Source: NTL and Telewest 3Q 2001 results and BT

3.3   Broadband Market Extensiveness

We have considered two components when assessing the extensiveness of international Broadband networks. The first is the current availability of Broadband as measured by the population coverage of affordable, mass-market services. The second is the addressable market for Broadband[10], which is a leading indicator of coverage.

Broadband Coverage

Broadband services in the UK have continued to develop over the past year and 60% of the population is now covered by an affordable Broadband technology[11] i.e. cable service or ADSL (Asymmetric Digital Subscriber Line) – see Figure 6.
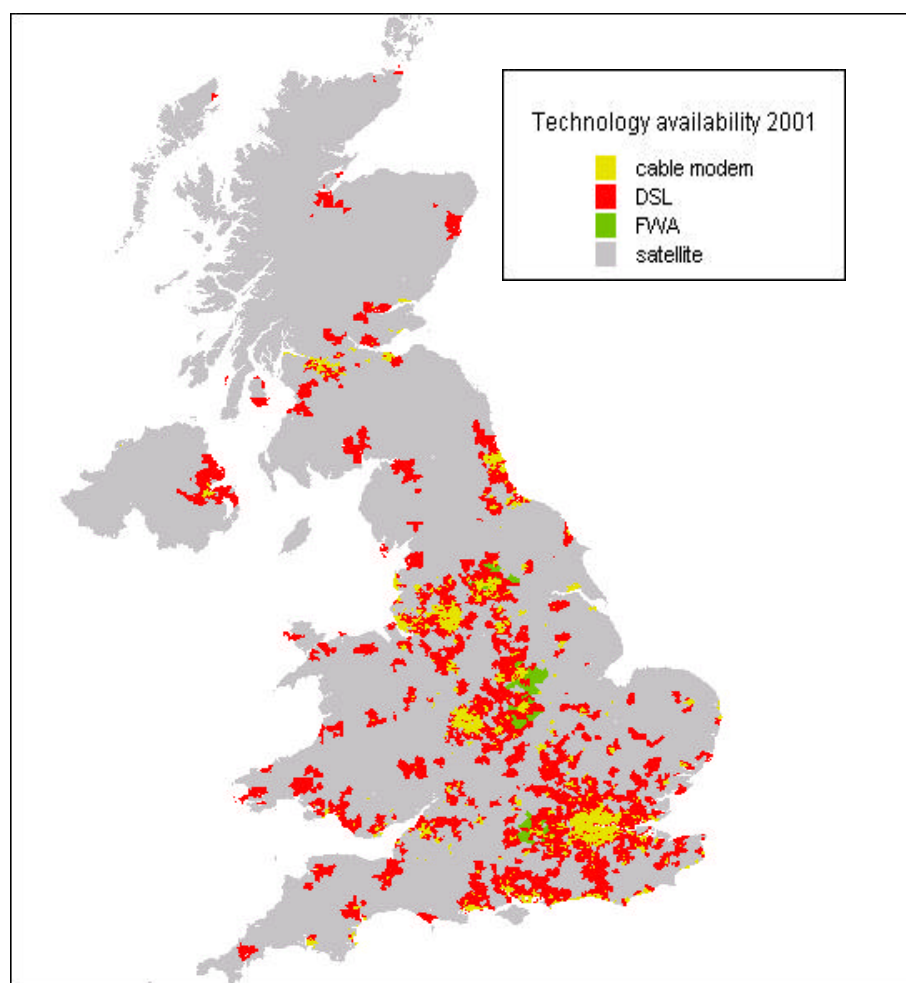
Figure 6 - Broadband Coverage in the UK – Analysys 2001

---

[10] Defined as the proportion of consumers in each country who have already adopted communications packages sharing common features with Broadband e.g. flat rate or higher connection speeds compared to analogue dial-up services.
[11] Analysys estimates of current Broadband availability in the UK – October 2001

This is comparable with the rest of the G7 – ahead of France but behind Canada and Germany. (See Figures 7 and 8)
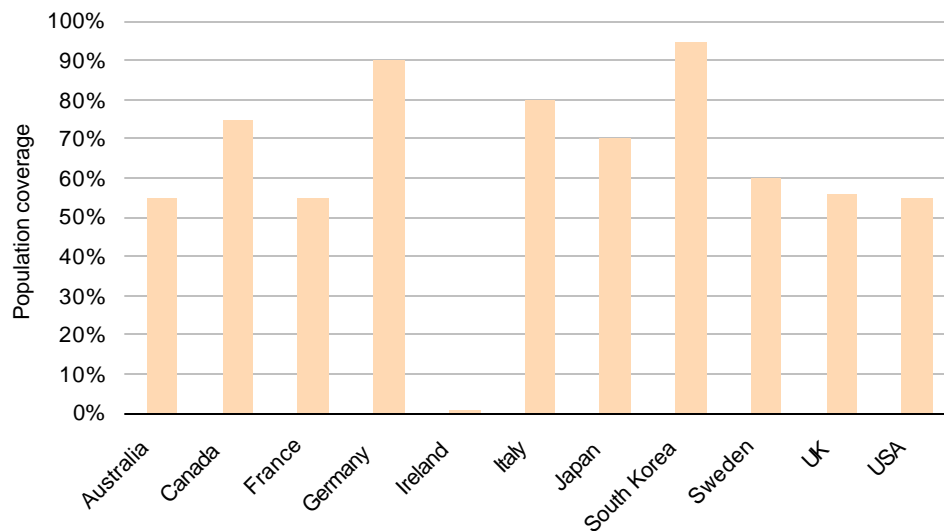
**Figure 7: Estimated population coverage of DSL by end 2001
[Source: Analysys]**
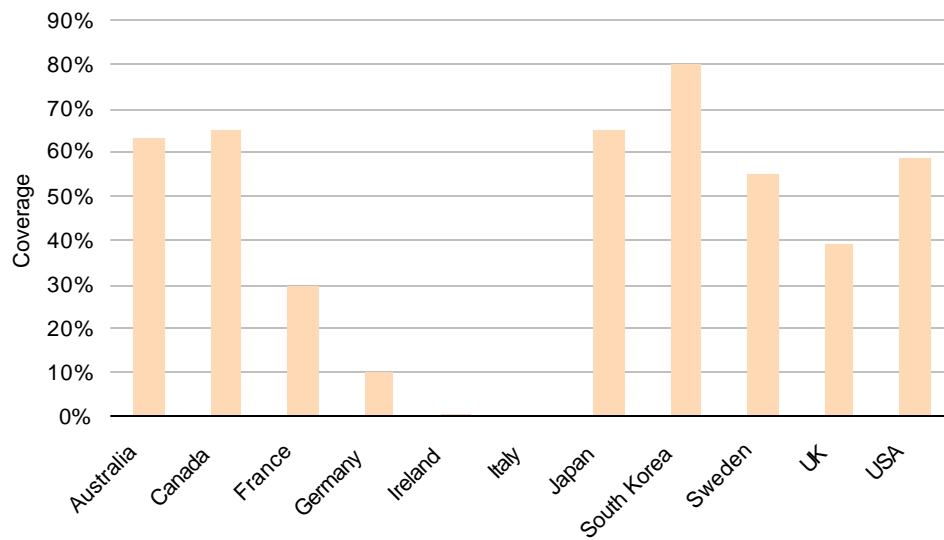
Figure 8: Cable modem coverage in 2001 [Source: Analysys]

UK Broadband coverage may increase to 75–80% by 2005[12]. However, initial roll-out has been concentrated in urban areas, where terrestrial services are more economic to deliver. Terrestrial service roll-out to rural areas has been very limited, as the high infrastructure costs required to reach consumers in less densely populated areas make them commercially unattractive for operators. This suggests that 20-25% of the country, primarily rural areas, will remain without access to terrestrial Broadband services. [note: technical limitations currently restrict the reach of ADSL to 5.5km of an enabled exchange].

Satellite services and leased lines are universally available and offer a potential solution to current gaps in rural provision, but they are priced well above cable and ADSL and are presently more suited to the business rather than residential applications. Improvements in Satellite technology may enable mass-market Broadband satellite solutions – priced competitively with terrestrial Broadband - to come on stream, within the next 3-5 years.

Licenses have been awarded to five companies to provide Broadband fixed wireless access services (BFWA) in the 28 GHz band in seven out of fourteen regions in the UK (covering 60% of the UK population). However, there is currently no commercial deployment of these services and it remains unclear when this will take place. Meanwhile the Radiocommunications Agency is seeking to re-auction the remaining seven 28 GHz licences with the original reserve prices and conditions. Tele 2 currently offers commercial BFWA data-only services for business and residential users in the Thames Valley, Leicester, Nottingham, Leeds and Bradford using spectrum at 3.4GHz.

Deployment of UMTS (Universal Mobile Telecommunication System) services is expected to begin at the end of 2002. Five operators won licenses at auction to provide these so called 'third-generation (3G)', mobile Broadband, packet-based services across the UK.

Addressable Market

Certain consumers can be regarded as having a high propensity towards taking up Broadband. These would include:
- heavy narrowband internet users on flat rate internet access packages,
- users on higher speed digital packages such as ISDN, and
- interactive Digital Television subscribers

All of these groups have taken up services that offer some of the key benefits delivered by Broadband (Flat rate, higher speed, access to interactive services). These consumers are therefore 'half-way' to adopting Broadband which combines all of these benefits with 'always on' access and they represent the primary addressable market for Broadband access and service providers.   The addressable market can be regarded as a leading indicator of the future extensiveness of the UK's Broadband market. The UK has a significant addressable market for Broadband based on:

- The UK has the 3rd highest internet penetration in the G7 a high proportion of which are on flat rate packages
- The UK has highest level of e-commerce outside the United States
- The UK leads the world in DTV penetration

---

[12] This remains speculative as most operators have not issued forward looking statements covering this period.

Extensiveness Performance

We have combined service coverage and addressable market into a single index for each country and the results show that the UK is currently ranked in 5th place in the G7 ahead of France and Italy.

See section 5

3.4   Broadband Market Competitiveness

We have considered 3 components when assessing the competitiveness of the UK's Broadband market – regulation, choice and price. Regulatory actions, such as local loop unbundling and separation of cable/ DSL network ownership are leading indicators of a more competitive marketplace. Choice is influenced by regulation and is a measure of current competitiveness either through competing technologies e.g. cable vs DSL, or through competing retailers reselling wholesale services. Price is influenced by choice and is a lagging indicator.

Regulation

The UK compares favourably to G7 countries against a fixed bundle of regulatory actions with the major differences across the G7 being timing - those countries that have been most successful in local loop unbundling are those that started earliest.

Regulation is required where normal market forces have been constrained due to incumbent operators having a dominant position. Regulation is relatively consistent across the range of countries, though with some notable exceptions. Figure 9 summarises the regulatory position of the countries studied in the key areas of Broadband regulation.

Country	Wholesale DSL	Wholesale cable	LLUB mandated	LLUB effective	Access upstream of MDF	Line sharing	Separation of network ownership[13]
Australia	Yes	No	Yes	Yes	No	Planned	No
Canada	Yes	Yes	Yes	Yes	No	No	Yes
France	Yes	No	Yes	Limited	No	No	Yes
Germany	No	No	Yes	Yes	Yes	Planned	Progressing
Ireland	Planned	No	Yes	No	No	No	Yes
Italy	Yes	No	Yes	Limited	No	No	No
Japan	Yes	No	Yes	Yes	Yes	No	Yes
South Korea	Planned	No	Planned	No	No	No	Yes
Sweden	Yes	No	Yes	Limited	No	No	No
UK	Yes	No	Yes	No	No	Yes	Yes
USA	Yes	Yes	Yes	Yes	No	Yes	Yes

Figure 9: Summary of international regulation [Source: Analysys]

However, regulation is only part of the equation. Some competitive countries, such as South Korea for example, have a less 'advanced' regulatory regime but a high level of infrastructure competition and a dynamic market. The effectiveness of LLU is relative – no country yet has a LLU situation that has fully met expectations.

---

[13] Separation of network ownership refers to whether the incumbent operator (ILEC) also owns significant cable assets (i.e. main cable operator)

Choice

Most consumers with access to Broadband also have a choice between Broadband packages. Infrastructure competition is provided between cable and DSL technologies, with over 75% of households in urban centres[14], (37% of the population), having a choice between the two. There is also competition in the DSL market at retail level. As of October 2001, more than 190 companies, including operators and service providers, had signed up to BT's wholesale services which allows them to provide retail services to end-users over BT's network[15].

Local Loop Unbundling was intended to increase the potential for infrastructure competition in the DSL market by providing alternative operators with direct access to BT's local loop. BT's original plans (agreed with Oftel) were for 600 exchanges to be unbundled by July 2001. This programme was brought forward following enactment of an EU Regulation making the provision of LLU mandatory from 1 January 2001. The LLU process has not resulted in the expected levels of take-up, with just 163 residential lines being unbundled so far.

Despite the disappointing impact of LLU, UK consumers have a greater degree of choice than other European countries in two key respects. They have more choice compared to countries where there is less Cable-DSL infrastructure competition; and more choice compared to countries that have not provided for wholesale DSL services. (It should be noted that LLU has so far failed to meet expectations in most EU Member States).

Price

Figures 4 and 5 show the average annual cost of a Broadband connection for a residential subscriber and a 'low-speed' business user, comparing on a like-for-like basis where possible, although some disparity is inevitable.

Prices are calculated using exchange rates as at 6 August 2001. In the USA, results have been adjusted to account for purchasing power parity (PPP). Note that countries with the highest penetration have the lowest charges (such as Canada, Sweden and South Korea).

---

[14] Defined as having a population density of >2079 houses per square kilometre
[15] Source: Oftel
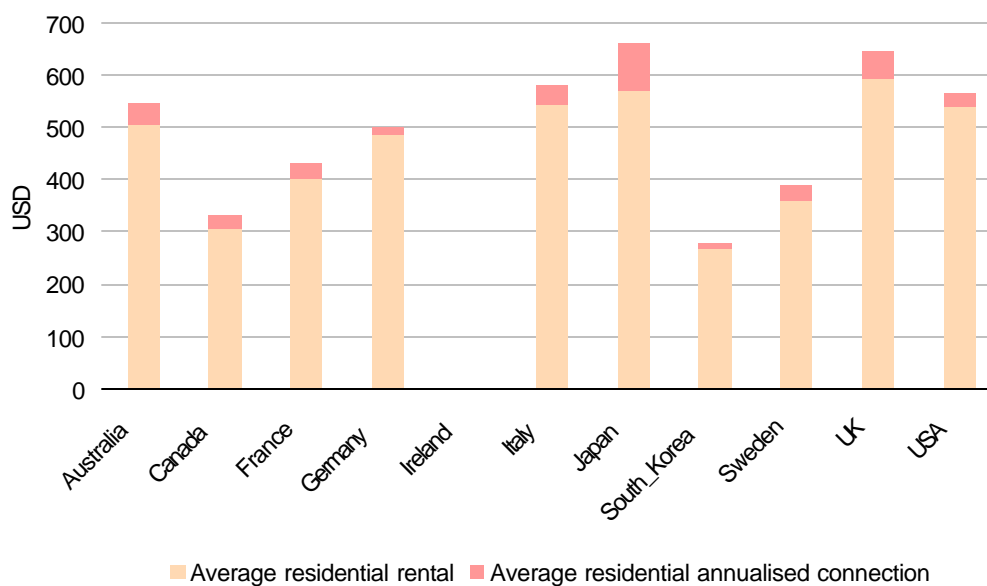
Figure 10: Average residential rental charges for service [Source: Analysys][16]
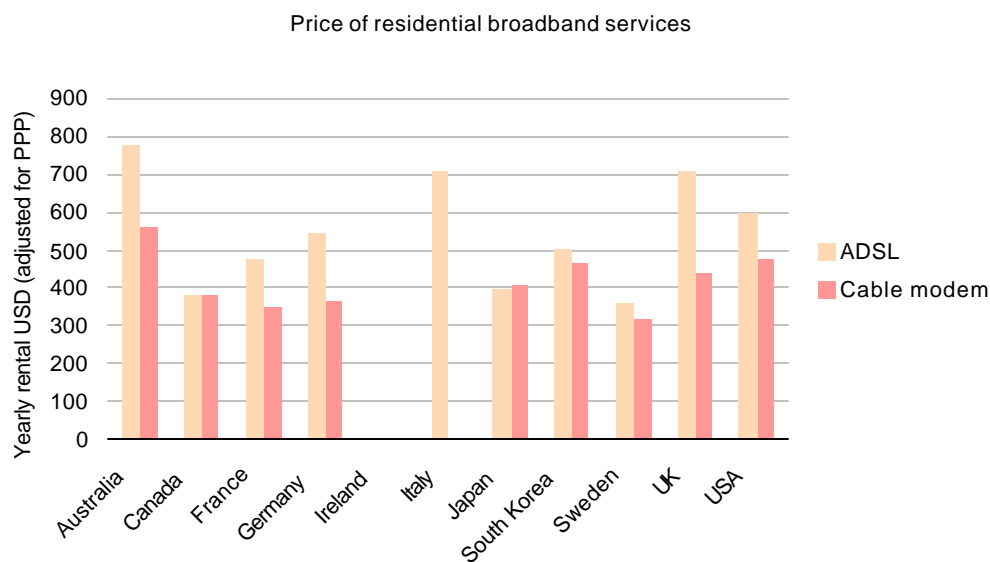
**Figure 11: Yearly rental for a residential Broadband connection,
excluding connection charges [Source: Analysys]**

---

[16] The average price is calculated as the average of the leading residential DSL and residential cable modem price, weighted by availability. Connection charges are annualised over a three-year period. Differences in quality of service may exist. No commercial residential services are available in Ireland.

There are signs that infrastructure competition is impacting price with reductions in cable prices announced early in the year. BT has recently reduced wholesale DSL prices and installation costs. Plans to roll out lower cost self-install ADSL services from December should lower DSL prices even further.

Competitiveness Performance

Based on our competitiveness index, which combines regulation, choice and price, the UK is currently in 4th place in the G7, ahead of the EU countries France, Italy and Germany.

See Section 5

3.5 Broadband Service Take-up

As of September 2001, approximately 214,000 Broadband cable and DSL lines had been rented in the UK. Less than 1% of UK households are connected via Broadband and the UK was in 7th place in the G7 according to OECD's international comparisons in June - Figure 12. Growth has been strong, as shown Figure 13, with subscriber numbers up 450% from last December. The growth of cable services in particular has been the highest in the OECD over the last year[17]. And growth of DSL in the first six months outstripped that of France and Germany.

Broadband Subscribers: Cable + DSL
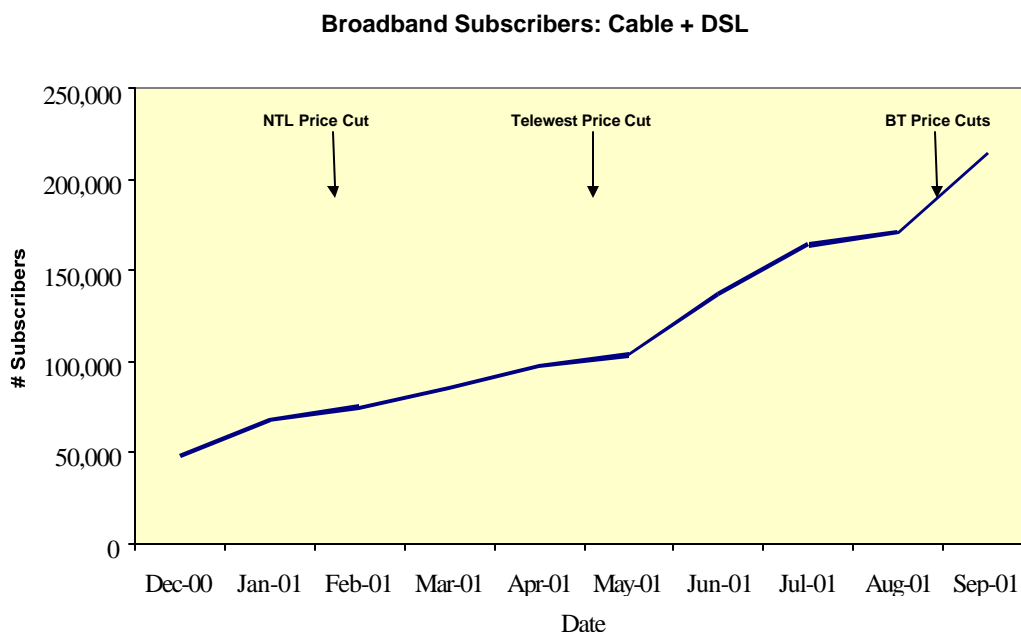
Figure 12: Broadband Subscriber Numbers - OFTEL
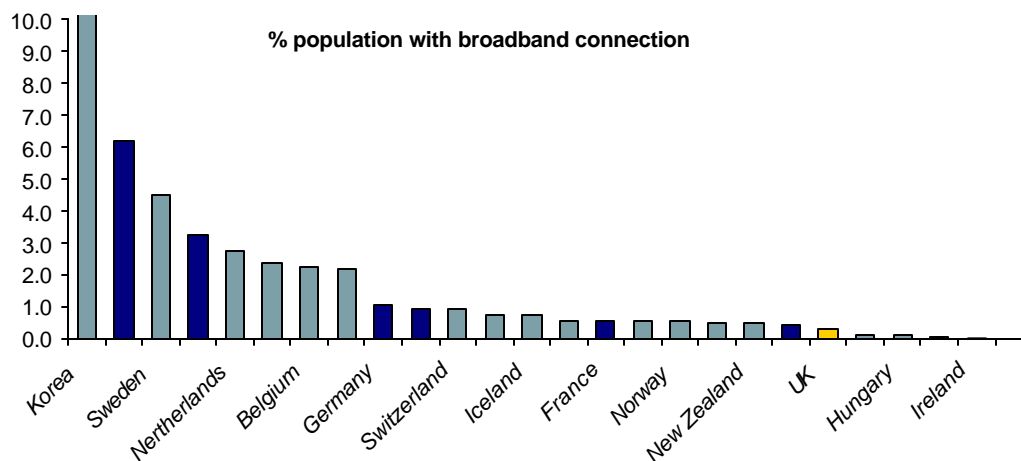
Figure 13: Population with Broadband connection, OECD June 2001

---

[17] DSTI/ICCP/TISP(2001)2/REV1 issued October 2001

3.6   Policy Actions Being Taken In Other Benchmark Countries

Finally, we believe UK strategy needs to be informed by benchmarking of policy initiatives being taken by other governments. Figure 14 provides:

Country	Policy	Estimated cost	Description
Australia	Un-timed local calls	AUD150m	Policy of access to untimed local calls for all. 28 000 Australians living in remote rural locations are to receive free access to AUD3500 worth of Broadband two way satellite technology (for a limited time). By shifting Internet traffic to satellite, the government hopes to free up telephone line space in rural Australia. Funded by sale of Telstra Corp Ltd (Telstra) shares.
Canada	National Broadband task force action plan	CAD4bn	Four basic principals are: • all communities linked to national Broadband networks capable of supporting 1.5 Mbit/s to each end user • priority to connect remote and rural communities • access infrastructure extended to all public facilities • access infrastructure extended to local business and residential users Two basic models are proposed for implementation • infrastructure support model – government to provide funding to network builders • community aggregator model – government to invest in user-based demand aggregators to stimulate delivery of Broadband capability.
(Alberta)	Supernet	Unknown	Investment capital to be provided by province authorities to build network to link communities with <400 inhabitants. Government to act as anchor tenant, with Broadband connection to every hospital, school, library and government facility within the province.
France	Broadband access to rural areas	FFR1.5bn plus FFR 10bn loans	Plans include FFR1.5bn to finance fibre networks to areas where investment is not viable on a commercial basis, with a further FFR10bn offered as low cost loans. To speed up roll-out and reduce cost, Electricité de France (EDF) will allow network operators to install fibre alongside existing electricity lines.
Japan	Tax incentives	JPY700m in 2000, JPY1 000m in 2001	Tax incentives to encourage the private sector to provide fibre networks since 1995. This is to be extended to DSL, cable and fixed wireless access. Incentives include subsidy for loan interest, corporate tax incentives, property tax incentives.
	Fibre networks to rural areas	JPY40b-JPY50bn	August 2001, plans announced to spend JPY40b-JPY50bn over four years to provide fibre networks in rural areas. The programme will pick 150–200 villages and towns willing to upgrade local communications systems and subsidise half of the expenditure.
	Govt. fibre-optic network	Unknown	Government to open its dedicated fibre-optic network to private communications companies by April 2002

South Korea	Korea Information Infrastructure (KII) plan	Over WON 32 000bn (GBP17bn) by 2010	In 1998 KII was launched, with GBP17bn to be spent over 12 years by public and private sector on infrastructure development to provide Broadband access. April 1999 'Cyber Korea 21' was launched to speed up completion of KII. CK21 aims to provide universal access to 1.5 Mbit/s services plus Internet connection for every school by 2002. July 2001 a new initiative was announced to provide 85% of homes with access to 20Mbit/s Internet access by 2005, at an estimated cost of approximately GBP10bn.
	Education system	Unknown	A high proportion of school-work is undertaken online, stimulating Broadband requirements.
Sweden	Broadband networks in rural areas	SEK10bn	Swedish government intends to spend SEK 10bn (GBP 680m) by 2004 to provide Broadband network access to 98% of the country's towns and villages, including those in rural areas. The funding is expected to be matched by private investment of equal size.
	National Broadband network	Unknown	The state is committed to building a national Broadband network through a telecoms subsidiary of the national electricity grid operator (SVK). The system is to be completed by 2005, will be operated independently and will be open to all ISPs that want to rent dark fibre .
	Tax incentives	Unknown	Subscribers have the possibility of tax reductions where the cost of a Broadband connection exceeds SEK8000 (GBP540). The funding is for 50% of the costs that exceed SEK8000, up to a maximum of SEK5000
USA	Demand aggregation	Unknown	Some states, such as Washington and Colorado have passed legislation, or provide government sponsoring to encourage the aggregation of public and private demand
	Tax incentives	Unknown	Most states offer some form of tax credit to telecom companies to provide services to disadvantaged areas. The more economically depressed the area the greater the tax incentive

Figure 14: Summary of policy actions to stimulate Broadband

3.7 BSG – Current state of play- SWOT Analysis

STRENGTHS	OPPORTUNITIES
- High level of narrowband take-up (40%) - High percentage of narrowband users on flat rate (FRIACO 35%) - Relatively high level of e-commerce activity (compared with countries outside the United States) - Relatively high level of competition at the retail level 60% UK population with access to Broadband (DSL or Cable) 40% UK population with access to more than one supplier - Strong UK media/ creative content sector - Comparatively high level of ICT skills - Predominance of the English language on the internet	- Replicate UK's success in narrowband - Exploit UK's large addressable market for Broadband - Encourage infrastructure investment to increase coverage and competition - Improve promotion to drive take-up - Exploit content, applications and services development to drive demand - Harness Broadband for more effective and efficient public services - Aggregate public sector procurement to support Broadband rollout - Boost education and the ICT skills base - Increase UK innovation, growth and competitiveness - Make the UK more attractive for inward investment
WEAKNESSES	**THREATS**
- Low level of Broadband take-up - Comparative high price of Broadband Access - Relatively low level of competition in the wholesale market - Access limited to urban areas with rural/ remote areas commercially unattractive - Lack of compelling content to drive demand - High cost of capital restricting infrastructure investment - Poor take-up of FWA licenses - Fragmented government and public service ICT procurement - Low level of awareness of Broadband and benefits of Broadband	- High cost of capital limits infrastructure investment - Comparatively high price of DSL inhibits take-up - Low price flat rate narrowband inhibits take-up - Lack of new content and applications inhibit take-up - Low level of take-up delays content development and innovation - Dispersed demand leaves rural areas commercially unattractive and unserved - Fragmented government procurement leads to inefficient patchwork of take-up and exploitation in public services - UK fails to capitalise on efficiency and productivity gains and opportunities for growth and innovation

Figure 15: UK Broadband SWOT analysis

4.   BSG STRATEGIC RECOMMENDATIONS

The Broadband Stakeholders Group (BSG) has highlighted six key areas of consensus:

- Broadband has enormous potential to benefit UK citizens and businesses alike.

- Although the UK is not where it should be on some measures, it has significant strengths.

- It is time to build on these strengths and create a positive climate for Broadband.

- The success of Broadband will require progress at all levels of the value chain.

- The key to that progress will be a competitive and innovative market.

- Selective Government involvement will be essential to move the market forward faster.

Improving the availability and take-up of mass market Broadband is a long-distance race, not a sprint, particularly as success means Broadband must reach every corner of the UK.   Any successful strategy must therefore build on the UK's fundamental long-term strategic strengths and advantages: high level of narrowband take up; high levels of e-commerce; the dominance of the English language in online activities; proven creativity skills; multiple modern communications infrastructures across a large proportion of the population; and a world-leading position in digital TV. The BSG therefore urges the Government to pursue a long-term strategy to:

- *Let the market flourish*
Remove regulatory and other barriers wherever possible, ensure investment and innovation are encouraged, promote competition as the key objective of regulation, avoid technology or other distortions.

- *Put Broadband on the national agenda*
Help citizens and businesses understand "Broadband" and what it offers, assist with training in how to use Broadband to create and consume services, ensure all schools have access to Broadband services.

- *Commit the public sector to Broadband*
Businesses will move cautiously until critical mass is close to hand, whereas the public sector (at national, regional and local levels) can and should invest in putting public services online and ensuring Broadband access to public premises ahead of critical mass emerging.

- *Address the Digital Divide, while securing the Digital Dividend*
Ensure Broadband is progressively more widely available (including at community locations), but encourage and then use the conspicuous success of Broadband in the areas of initial availability as the key tool for improving roll-out.

Based on the analysis of the current state of play and the UK's relative strengths and weaknesses the BSG has developed a framework of 15 strategic recommendations to meet these objectives. These recommendations aim to accelerate market and public sector driven deployment and use and include demand, supply and regulatory measures.

Accelerating Market Driven Deployment and Take Up
1. Implement supply side infrastructure support to reduce cost of capital
2. Encourage infrastructure sharing to reduce the need for capital
3. Promote increased competition in the BT Local Loop
4. Promote Broadband interconnection
5. Stimulate the supply of Broadband content, applications and services
6. Tackle skills needs for Broadband development
7. Introduce quality of service measures
8. Raise awareness and promote the benefits of Broadband to consumers and SMEs
9. Introduce demand side fiscal incentives to accelerate take up

Enabling Public Sector Driven Deployment and Use
10. Aggregate public sector demand for Broadband
11. Facilitate public access to Broadband facilities
12. Mazimise efficiency and productivity gains in public services
13. Facilitate access to Broadband public services

Ensuring Appropriate Regulation
14. Enable a stable and predictable regulatory framework
15. Remove and prevent regulatory barriers to investment

Framework for the BSG Strategic Recommendations

	Accelerating market driven deployment and use		Enabling public sector driven deployment and use	
	Increase market driven coverage	Promote the take-up of Broadband	Move towards universal access	Maximise the public service benefits
Supply	Rec 1. Implement supply side infrastructure support to reduce the cost of capital Rec 2. Encourage infrastructure sharing to reduce the need for capital Rec 3. Promote increased competition in the local loop Rec 4. Promote Broadband interconnection	Rec 5. Stimulate supply of Broadband content, applications and services Rec 6. Tackle skills need for Broadband content development Rec 7. Introduce quality of service measures	Rec 10. Aggregate public sector demand for Broadband Rec 11. Facilitate access to Broadband facilities	
Demand		Rec 8. Raise awareness and promote the benefits of Broadband to consumers and SMEs Rec 9. Introduce demand side fiscal measures		Rec 12. Maximise efficiency and productivity gains in public services Rec 13. Facilitate access to Broadband public services
Regulatory	Rec 14. Enable a stable and predictable Regulatory Framework Rec 15. Remove and prevent regulatory barriers to investment			

Figure 16: Framework for BSG Strategic recommendations

4.1 Accelerating Market Driven Deployment and Take Up

Objective: To increase market driven coverage and encourage take up of Broadband

4.1.1 Accelerating Market Driven Deployment and Take Up - <u>Supply Side Measures</u>

Broadband is currently available to about 60% of UK households via cable or ADSL, most of which are in urban areas of higher population density. However, in order for the market to provide local access infrastructure more widely a number of barriers will have to be overcome. Reducing the cost of capital through fiscal measures and reducing the need for capital through infrastructure sharing will lower investment costs for operators, making some areas, where the business case is marginal, more commercially attractive. At the same time these measures will also benefit new players seeking to enter the market with alternative networks such as Fixed Wireless Access and Satellite. These alternative technologies, including 3G, will increase levels of competition in the Broadband market and put downward pressure on prices.

Meanwhile, action is required to stimulate the supply of Broadband content, applications and services. Developers (particularly SMEs) are reluctant to invest in developing innovative 'Broadband only' content applications and services until they have a clear market of Broadband users to address. In the short to medium term it will be necessary to find innovative ways to prime the content and applications development sector in the UK. This could be done through a variety of measures, such as the establishment of a content development fund. Government procurement of content and applications will also help to provide a tangible market for content developers in the near term (see section 5.2.2).

Recommendations

Rec 1.　　Supply side infrastructure support to reduce the cost of capital

The current risk averse financial climate and the aggregate debt of the industry is inhibiting the ability of communications companies to raise and/or commit the substantial capital required for investment needed either to extend or upgrade existing networks or build new ones. This situation is affecting the rollout of all Broadband technologies, which are by nature cash hungry.

Whilst capital costs have fallen for the economy as whole, the risk-weighted price of funds to the telecoms industry remains much higher than other utility type investments. In addition, institutions are reluctant to fund projects in this sector because of uncertainty and recent volatility.

Access to debt, credit and bridging finance was significantly reduced following comments made by banking regulators concerning banking over exposure to the telecommunications market in Q3 2000. Meanwhile, most governments in the G7 have identified Broadband deployment as a priority and the UK is in global competition with other nations to attract the scarce capital resources required to fund large scale investment in infrastructure, content, applications and services.

In order to encourage companies to roll out Broadband more quickly the perceived risk to suppliers needs to be reduced. One way of achieving this would be through an effective reduction in the cost of capital for network build using fiscal measures to encourage investment. Any policy would need to be technology neutral.

This will be particularly important for encouraging BT and the cable operators to extend/ upgrade their networks and for encouraging alternative infrastructure providers, such as BBFWA and satellite to enter the market in competition with the existing players.

Recommendation: The government should explore the potential impact of two specific measures that would help to reduce the cost of capital:

- Capital Cost Allowances (CCA): these allow companies to offset capital investment against taxable profit. Currently set at 25% of residual value per year, CCA could be brought forward so that more could be written off in the early years. Taxable profit is the profit as per the P&L account but with disallowable items added back, the most significant of which is depreciation. Whilst many telecommunications companies are making a loss on the P&L, the adding back in of depreciation may change to position.

- Tax Credits, which tend to work in two ways: either a company may claim more of a given type of expenditure against tax than was actually spent, or loss making companies may surrender the ability to carry forward some losses in exchange for cash from the Exchequer. Current UK policy allows small and medium enterprises to claim tax credits on R&D either by increasing the amount a company can deduct for qualifying current expenditure from 100% to 150%, or loss making companies can surrender loss attributable to the Exchequer and receive a cash payment of 24% of qualifying R&D expenditure in return.

In the case of Broadband, it would be possible to apply a similar scheme of relief to expenditure on developing certain types of network build. In the current circumstances, where most companies are loss making, a tax credit based system would be more attractive if the cash payment element was included.

The potential impact of both these measures on increasing the supply of Broadband services and revenues for the Treasury need further examination, as would the secondary and tertiary effects on the UK economy.

Rec 2. Infrastructure sharing to reduce the need for capital

Accepting that one of the barriers is access to capital, particularly to provide higher bandwidths in the less densely populated areas, all means of reducing the need for capital in providing local Broadband access should be considered.

A significant requirement for capital is in primary infrastructure (i.e. ducts, buildings, masts and poles). This is particularly true for fixed network access operators competing with BT and for wireless network operators wanting to achieve universal coverage. Even BT (whose primary infrastructure is virtually ubiquitous) is faced with costly new investment to upgrade primary infrastructure in some areas.

Therefore, the more that existing cable ducts, equipment buildings, radio masts and poles can be shared, (or if the required primary facilities could be provided through other co-operative ventures, e.g. between industry and public sector), the more the capital required for further roll out of Broadband access will be reduced (and, hence, the barriers to new, competitive Broadband transmission system provision will be lowered). Note: Where primary infrastructure is shared, competitive supply to customers can occur at the transmission network and services level.

Recommendation: Oftel should work with industry and other relevant parties in the regions to develop infrastructure sharing options. Oftel should issue clear guidance as to the extent to which infrastructure sharing that is permissable without triggering competition concerns.

Rec 3.   Ensuring competition in the local loop

DSL is a prime technology for delivering Broadband and there was considerable expectation that Local Loop Unbundling would quickly lead to significant competition in the Broadband access market. However, this initial optimism has faded, progress in take-up of unbundled loops since launch has been slower than anticipated. Customers, operators, equipment vendors, and government have all shared a sense of frustration at the sheer complexity and difficulty of putting LLU into operation. In the meantime, several players have withdrawn from the market. Legislators, Oftel, BT and the industry need to learn the lessons from the local loop unbundling experience, which may be relevant to the rollout of higher specification DSL.

Recommendation: Oftel should benchmark its performance in achieving LLU against EU and G8 countries. Oftel and the industry should prioritise agreeing price and procedures for the rollout of line sharing as an alternative to full LLU. The DTI and Oftel should consider any further steps needed in light of the current evaluation of LLU implementation across the EU currently being undertaken by the European Commission.

Rec 4.   Developing Broadband interconnectivity

The accepted interconnection model in the telephone world is of any-to-any, i.e. any telephone user can connect with any other telephone user, anywhere in the world. Ultimately, the same principle could apply in the multimedia world, i.e. any consumer should be able to (and will wish to) access any service over their chosen access network. This is particularly important where an economic case might support only a single access network.

The telephony model has been achieved through interconnection of different networks at narrowband. The multimedia model will have to be achieved through interconnection at different levels of Broadband. Establishing interconnection rules, and terms and conditions, is a lengthy process. Technically, there are numerous potential problems. Equally, to set the right economic signals for Broadband access investment, the commercial terms for carriage of services over different networks must be established. Early narrowband interconnection agreements often took 15-18 months to resolve. Lack of Broadband interconnection could inhibit consumer access and the mass-market take-up of Broadband connections. This suggests that a key activity in the immediate future should be to review the issues involved in Broadband interconnect.

Recommendation: Oftel must work together with the industry to develop Broadband interconnection models that allow data and services to flow from 'any-to-any'. Current models are based on narrowband telephony and will have to be updated.

Rec 5.   Stimulating the supply of Broadband content, applications and services

A range of measures should be taken to help stimulate the development and production of Broadband content and applications.

Rec 5.1   Content initiative development

The Broadband Stakeholders Group has generated a variety of specific suggestions for content initiatives, many with a public service emphasis. These include health applications (e.g. providing rich media resources to help with the implementation of National Service Frameworks and other key NHS documents); education applications (e.g. schools credits for Broadband content); and skills applications (e.g. verifiable online CPD for professionals and lifelong learning for other workers) [see Rec 12 below].

These suggestions should form the springboard for a content development forum hosted by a suitable organisation such as the Digital Content Forum (Broadband Industry Action Group) to take the initial work of the Broadband Stakeholders Group in the content arena a step further with a view to producing a spin-off content report (including regular interim progress reports) starting immediately and completing work within the quarter.

The fruits of this process could then be fed into the next two recommendations over the period (with initial input happening within a month).

Rec 5.2   Broadband beacon projects

Setting up some judiciously selected beacon projects would be useful in establishing the benefits of Broadband both in practical and entertainment terms. These projects will need to be high profile and at least some of them will need to be of a nature likely to capture the public imagination, creating excitement around the new medium. In addition these would provide the opportunity for key associated technologies such as secure micro-payment systems to be put through their paces.

It is important that these beacon projects are open to smaller independent producers where much of the best innovation often occurs.

Rec 5.3   Government procurement of content and applications

Government commitment to procure Broadband content, applications and services will in itself provide a very significant initial stimulus to the content development industry, especially where such procurement is aggregated. There are numerous areas where Broadband could directly benefit UK citizens by providing easier, faster access to government services and enhanced online versions of those services. Examples of such initiatives are detailed in Rec 12 below.

Rec 5.4   Supportive trading environment/tax regime

Particularly in the current adverse investment climate, the Government needs to work with appropriate content producer representative bodies to clarify and ameliorate the tax position of Broadband content in relation to Research & Development, lease-back schemes, and the like.

Rec 6.   Tackling skills needs of the Broadband content, applications and services sector

Clearly, there is a need to ensure that the UK has an appropriate skills base to exploit the opportunities presented by Broadband, particularly in content and applications development.

Recommendation: Government and the DCF Skills Industry Action Group should continue to develop a strategy to address the skills needs of the content sector including:

- Ensure that Broadband Content Pilots stimulate knowledge transfer and dissemination;

- Allocate funding to research by the NTOs in conjunction with the DCF into the creation of a skills map for Broadband production.

Rec 7.   Quality of service measures

Consumers have a right to expect their equipment to operate at the connection speeds advertised by their service providers. The contention ratios used on a variety of Broadband platforms mean that services sometimes give end-to-end performance substantially below the rate advertised by the operators. Consumers could quickly become disillusioned if they discover that their connections actually perform considerably more slowly than the advertised product. It would therefore be advantageous to both the industry and consumers for quality of service standards to be agreed for Broadband performance. It would also be advantageous for content providers to know what technical environment they need to design for.

Recommendation: Oftel should work with service providers to set and verify quality of service standards for actual data rates achieved at customer premises. This could be modelled on Oftel's monitoring programme for cellular networks.

4.1.2 Accelerating Market Driven Deployment and Take Up - <u>Demand Side Measures</u>

Whilst 60% of the UK population currently have access to Broadband, current take-up remains low at about 1 %. The initiatives outlined above to improve the supply of Broadband access and content applications and services must be matched with effective measures to stimulate demand. In the short term, a joint marketing initiative will help to raise awareness of the benefits of Broadband for consumers – always on fast access to the internet. Fiscal incentives could also help to reduce initial installation costs and accelerate take-up. However, in the medium to long term, it will be the development of new, even revolutionary, compelling 'Broadband only' content, applications and services that will drive the mass take up of Broadband.

Rec 8.   Raising awareness and promoting the benefits of Broadband

Rec 8.1   <u>Joint Promotion</u>

Slow take-up of Broadband may in part be due to late / poor promotion of Broadband services. Initially there was little advertising to promote Broadband services and promotion tended to focus on features (bandwidth) rather than the benefits. Moreover, media coverage of the LLU process may have confused consumers and made them more sceptical about the value and benefits of Broadband. Consumers are also likely to be uncertain about the range of technology solutions available to them.

As the access market develops there may be a role for increased promotion through advertising done on a cooperative basis between interested suppliers. In the US the DSL Forum coordinated a successful cooperative advertising campaign. This could be done in the UK with government support and BSG members are committed to exploring this option in the near future.

Government should work together with the BSG to develop an action plan for collaborative promotion and awareness raising for consumers and SMEs.

Rec 8.2   <u>Encourage SMEs to take up e-Commerce solutions</u>

Greater effort is also required to promote the benefits of Broadband to SMEs to explain how Broadband can enhance their businesses.

The Government should build on current initiatives to encourage and assist the adoption of e-commerce solutions by SMEs and highlight the specific benefits of Broadband. Government can support the take up of e-commerce by SMEs, in particular by:

- Clarifying and simplifying the VAT treatment of e-content and perhaps reduce VAT on e commerce transactions for SMEs
- Funding the setting up of a portal for SMEs to select the correct e-commerce applications from ASPs
- Providing grants to SMEs to cover the cost of acquiring Broadband content and applications for a limited period (perhaps six months)
- Providing more effective advice to SMEs on the introduction and setting up of e business solutions with particular emphasis on the benefits of Broadband

Rec 9.   Demand side fiscal incentives

A number of measures could be taken which would help stimulate demand for Broadband services through an effective reduction in costs to the consumer, either residential or business. As with supply side measures, such measures should be technology neutral.

Recommendations: The Treasury should investigate the impact of the suggestions listed below. (The possible effect of these measures would need to be examined through a detailed analysis of the likely stimulant to demand resulting from the price reduction and its secondary and tertiary effects on economic activity and tax revenues):

- A generally applied tax relief on the cost of Broadband access devices and services. At this stage in the development of Broadband, the topology of demand is difficult, if not impossible, to determine. A generally applied relief, i.e. not targeting any particular application or user segment, would therefore allow the demand side of the market to develop in an undistorted manner.

- The government should consider allowing personal use of all Broadband Access Devices to be exempt from taxation. This would include wireless Broadband devices such as GPRS and UMTS devices. Similarly company funded Broadband access lines to the home should be made free of tax.

- Tax breaks available to self-employed persons, should be extended to the employed for the costs of all items related to Broadband access. For example, Broadband Access Devices purchased by an individual, but used for business, should be tax deductible.

- Tax breaks for personal investment in training related to current employment should be extended to cover Broadband access devices and services used to access education and training whether or not these are related to current employment, e.g. acquiring skills for a career change. Non-tax payers should receive a cash payment for proposed training using Broadband.

- VAT exemption on Broadband Access Devices, network connections, subscription and usage charges. Eliminating VAT would have the effect of reducing prices for individuals and small companies below the VAT threshold. Depending on the price elasticity of demand for such goods and services such an effective price reduction would therefore stimulate demand.

- The use of tax credits, discussed under supply side measures, could also be extended to business investment in Broadband access devices and related equipment and services for access to services.

4.2.2   Enabling Public Sector Driven Deployment and Use

Objective: *To move towards universal access and maximise the public service benefits for UK citizens*

The UK government, in all of its forms, represents over 35% of GDP. It is the single largest player in the economic activity of the country and can play a major role as a user of Broadband. Broadband can bring significant efficiency and effectiveness gains for the operation and delivery of public services and will be essential for achieving many of the government's objectives for improved public services. If properly coordinated, Government procurement can play a significant role in extending Broadband coverage to areas of the UK that would not otherwise be viable for commercial operators, and in so doing can help the UK to move towards universal service and help to bridge the digital divide.

4.2.1   Enabling Public Sector Driven Deployment and Use - <u>Supply Side Measures</u>

Coordinated procurement by public services can help to extend Broadband coverage more widely in the UK. Government can also play a direct role in providing public access to Broadband facilities.

Rec 10.   Public sector demand aggregation

Many if not most public sector organisations are likely to need access to Broadband in the near future (see Rec. 12). Much of this demand will be in locations outside the current Broadband coverage areas that are currently deemed uneconomic by operators. By aggregating this demand (i.e. combining procurement from different public services and bringing it to market in a coordinated manner) government could provide a guaranteed level of business for Broadband operators, that would improve the commercial case for rolling out networks in these areas.

Aggregated procurement would accelerate the timetable for connecting the public sector to Broadband in non-urban areas, would assist in correcting regional imbalances and help to rejuvenate rural and remote areas. It has been estimated that, overall, demand aggregation would increase the take up of Broadband by residential and business users by more than 1.3m by 2010.

Recommendation: The government must commit to providing Broadband access to all points of learning and should seek to aggregate demand from all other key public services to accelerate Broadband take-up.

The Government needs to consider, together with industry, how it can 'aggregate' public sector demand for Broadband, particularly with a view to:

- facilitating Broadband roll-out in regions where Broadband companies may otherwise find it uneconomic to do so; and
- ensuring in areas where demand for Broadband exceeds supply that, subject to value for money considerations, public sector Broadband procurement is used to create new infrastructure rather than simply to buy up space on existing infrastructure.

Demand aggregation represents a serious challenge for government and will require a huge amount of coordination between different departments and levels of government. Considerable work will be required on the practicalities required to put the machinery of government in place to manage such a programme (see also Rec 13).

It will also be necessary to ensure that aggregated procurement does not distort the market or favour any particular technology. Nevertheless the BSG believes that these problems are not insurmountable and urges the government to work closely with the industry to explore and resolve these issues. Government can not afford to continue to implement ICT procurement on the current fragmented basis.

The following public services can and should benefit from Broadband:

Education (all points of learning)	Primary schools
	Secondary schools
	Independent schools
	Special schools / PRUs
	Universities
	Other HE / FE
	Libraries
	Museums
Health	GP practices
	Dental practices
	Health centres
	Hospitals
	Care homes
Transactional	Post offices
	Job centres
	Social security
Justice	Courts
	Prisons
	Probation services
	Police stations
	CCTV
Defence	Defence sites
Government	Local government
	Central government

Rec 11.   Facilitating access to Broadband facilities

As well as extending coverage and access for public services it will be necessary to facilitate physical access to Broadband facilities for people without access in the home. In order to catalyse the demand for Broadband it will be necessary to give as many people as possible the experience of Broadband in their daily lives and businesses. Creating a location in each community where people can use and experience the value of Broadband, a 'BroadPlace', is seen as an interim commercial proposition to universal take-up.

The value of such a BroadPlace is twofold for both government and business. Firstly, a well equipped and supported BroadPlace extends the opportunity for tele-working. Many people and businesses do not find isolated home working an effective solution. The facilities at home are often limited and many people (but not all) do not find it easy to manage the conflicts of work and family life in the home environment. A number of commercial operations are being proposed to create centres for such purposes across the country. Government, as well as business, could improve its own costs and internal operations, by being customer for workplaces for its employees on a contractual basis. This also carries benefits for employees in reducing work travel time and for communities in creating local employment opportunity and reducing transport congestion.

Secondly, a BroadPlace can create local access to Broadband for delivery of commercial and governmental services. Most services are only available from very specific locations (e.g. banks, shops, police stations, libraries, etc.) but are accessed by all consumers and citizens alike. Broadband, through a local centre, can provide a version of these services into each community, extending their availability geographically but also potentially for more time of each day. For government Broadband can therefore support the objectives of health and education in particular, but also of the full range of government services at all levels.

BroadPlaces may well be associated with existing government sites and come within the scope for Broadband infrastructure deployment. With their variety of services they support they create additional commercial justification. Alternatively the business case is likely to be strong enough for independent centres to be created, again delivering facilities to both commerce and government.

Each BroadPlace is therefore a customer for the appropriate infrastructures to be deployed to its site by the relevant operators. It must be stressed that this is seen as just one important step in increasing both the deployment of Broadband infrastructure and the awareness of its advantages; it is not a substitute, in the end, for Broadband access to all businesses and households.

Recommendation: The government should create a point of delivery for Broadband services in each community (a "Broad-place"), extending the opportunity for teleworking and creating local access for delivery of commercial and Government services.

4.2.1   Enabling Public Sector Driven Deployment and Use - <u>Demand Side Measures</u>

Government must harness the potential of Broadband to achieve more efficient and effective public services. In so doing government will stimulate the Broadband content, applications and services sector. By ensuring that all points of learning have access to Broadband, the government will help to ensure that school leavers and graduates have appropriate ICT skills. Providing citizens with physical access to Broadband facilities either through points of learning or BroadPlaces, and putting Broadband public services on line will also help to stimulate demand for Broadband and take-up.

Rec 12.   Maximising efficiency and productivity gains in public services

Broadband offers the prospect of more dynamic and personalised innovative public services, and the opportunity to focus delivery of services directly on the consumer.

Broadband promises to significantly impact both the way government interacts with itself and the way government interacts with its citizens.
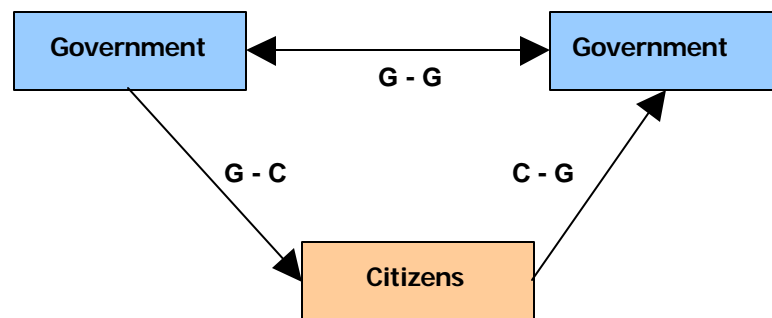
Examples:

G-C: 'Living Health', the joint initiative between the NHS and Telewest, brings over 18,000 pages of accredited medical information straight to the living rooms of citizens. The service is available 24 hours a day, 7 days a week, can be accessed through ones own television, and contains high quality digital content. Such a service would simply not be possible through a narrowband connection. This technology has the same potential to revolutionise education through distance learning, interactive seminars and the sharing of audio and visual content in real-time.

C-G: Similarly citizens' interaction with government, whether central or local, will be dramatically improved by Broadband. The same technology that allows the transfer of content from NHS to the public via 'Living Health' also permits individuals to interact with trained medical professionals in real time through video conferencing. Such a service would bring primary care one step closer to the citizen; alleviating waiting times in GP's surgeries and providing comfort to the 'worried well'. Without pervasive access, the UK's agenda for improving health and education will be much more difficult to achieve.

G-G: Broadband has the potential to break down barriers between departments and improve cross agency processes. The risks associated with IT services can be distributed more broadly and so costs can be reduced significantly. Broadband also offers scope for reduced transaction costs, improved productivity levels and heightened resource allocation.

Recommendation: Government should examine the business case for the following initiatives in the fields of health and education.

- As well as ensuring that all schools have access to Broadband it will be important to ensure that they have access to funds to purchase Broadband content. Provide electronic learning credits for schools (£2000 for primary schools and £10,000 for secondary schools), enabling them to acquire Broadband online content for teaching and learning purposes.

- Apply the same model to vocational training, continuing professional development and life long learning, with access via portals appropriate to the sector concerned (e.g. individual training credits to teachers and healthcare professionals).

- Provide NHS clinical guidelines and other related content on line to healthcare professionals in a more effective form than text-based, narrowband media (an "NHS Direct for healthcare professionals").

Rec 13.   Facilitating access to Broadband public services

This recommendation is directed at stimulating the availability of Broadband services and applications, to address the demand side of the commercial justification for Broadband. The portal represents a focal point for a wide variety of Broadband based services, applications and content.   The portal platform itself has to be common to all sources whether public or commercial.   Also the portal must be capable of delivering the set of services, applications and content in an appropriate manner over all forms of access infrastructure to all types of end user device (TV, PC or mobile handset).

The role of the Broadband Portal is exactly the same as a portal operated by an Internet Service Provider to deliver a range of services, applications and content to their customers. A Broadband Portal is therefore seen as a sustainable, commercial operation which can develop as a part of the business of established Service Providers, or become a new business in its own right.

Government itself should be a major source of services, applications and content and as such is perceived as a major customer for a Broadband Portal; in this context the portal operation delivers the means for aggregating the services for delivery over the appropriate infrastructure. There are already a variety of pilot schemes across the country involving separately specific areas of government (e.g. health, education etc.) using portals to consolidate and deliver Broadband based services.   The business of Broadband Portals should consolidate involvement of all sectors of government whilst enabling each to independently develop its own style, pace and support of its own activity.   This is also true of each independent commercial sector (e.g. banking, retail, etc.)

It is foreseen that a variety of Broadband Portals would be commercially available (as for ISP's). Particularly with the involvement of government services it is expected that portals would be configured to meet the diverse needs of each regional entity, particularly as local government will engage Broadband in a different manner.   The regional dimension is once again important, indeed it is anticipated that many portals would be regionally based.

Recommendation: The government itself engages with a number of Broadband Portal operators to deliver its own services, applications and content.

- Office of Government Commerce should create a common framework for contracts with Broadband portals and 'broadplace' businesses for delivery of and access to Government services.

- Furthermore, it is recommended that Broadband Steering Boards are created by each devolved administration and development agency, with representation of all local stakeholders, to implement local contracts for Broadband Portal and BroadPlace services within the OGC defined framework.

4.3 Reducing Regulatory Risk

The following horizontal regulatory issues are relevant to all aspects of Broadband rollout. The removal of existing regulatory barriers (and the avoidance of new barriers) together with the establishment of a stable and predictable regulatory regime will help to reduce the regulatory risk faced by investors.

Rec 14. Enabling a stable and predictable regulatory framework

Securing access to finance to build Broadband infrastructure necessitates an environment where regulatory risk to investors is at a manageable level. Whilst regulatory flexibility is essential in a fast moving market, there must also be a high degree of predictability and fairness. The BSG has therefore put considerable emphasis on the need for clear regulatory principles and a clear role for OFCOM. The signals that the Government sets in its forthcoming draft communications bill will frame the expectations of investors about the kind of regulatory environment that the government intends and the degree of regulatory risk that companies will face.

All levels of government have a key role to play to ensure that an appropriate regulatory framework is established. Inappropriate regulation, at national, regional or local level, if not addressed, will put a significant brake on Broadband rollout. In general the BSG recommends that all regulatory initiatives should be tested against the five principles set out by the government's Better Regulation Taskforce: transparency; accountability; proportionality; consistency and targeting.

Recommendations:

Rec 14.1   OFCOM – the future Broadband Regulator

The government has announced ambitious plans for the establishment of a single regulator for communications – OFCOM. This new 'converged' regulator will have the power to regulate both the Broadband networks and the services they carry and will therefore have a huge impact on the rollout of Broadband. The government must ensure that OFCOM's goals, function, structure and organisation are appropriate to the task of making the UK home to the most competitive Broadband market in the G7 by 2005.

OFCOM will have to balance the diverse interests of consumer bodies, content and application providers, service providers and manufacturers as well as different departments and layers of government. These interests will not always be aligned and will at times conflict. OFCOM therefore needs to have a very clear view of its overall objectives and will need to explain how it deals with such conflicts of interest.

- OFCOM's top-level objective should be to protect the interests of consumers (in both the long and short term) in particular, by the promotion of sustainable policies that will promote an open and internationally competitive market. This objective should be underpinned with a requirement for a programme of systematic comparative benchmarking to verify the UK's position in terms of international competitiveness. OFCOM should also be required to explain how it has balanced possible conflicts between these objectives.

- Meanwhile, it is essential that the five regulators being merged into OFCOM are able to function effectively during the transition process. Every effort should be made to ensure consistency and remove uncertainty during the implementation phase. The process will need

to be managed carefully to ensure continuity and to retain staff with the appropriate skills set.

Rec 14.2   Setting an appropriate regulatory framework

Excessive regulation distorts markets and discourages investment. To promote a competitive Broadband market, the UK needs to ensure that regulation is set at the minimum level appropriate to ensure effective competition and the protection of consumer interests. OFCOM must be able to regulate effectively to ensure competition (and at times this may require targeted sector specific regulation). However, OFCOM must ensure that regulation remains fit for purpose, and as the level of competition increases in the market, there should be a transition away from sector specific regulation towards competition law. Appropriate stimulants should therefore be built into the structure of OFCOM to ensure that this happens.

- In the context of Broadband, OFCOM should have a responsibility to review the market, remove obsolete rules and determine the appropriate level of regulation to achieve Government objectives.

- OFCOM should be obliged to report on its achievement of this objective, together with its other statutory objectives in its annual report, which should be laid before Parliament.

- Self-regulation should not lead to onerous resourcing or financial burdens being placed on industry. Particularly where industry is being asked to come forward with additional measures over and above existing statutory requirements. It will also be necessary to consider how consumers can be represented in self-regulatory schemes.

Rec 14.3   Ensuring consistent application of EU rules

Failure to implement legislation consistently across the EU has led to the persistence of diverse national regulation that distorts the single market, increases uncertainty, and leads to additional costs and delays for businesses.

- The BSG believes that the European Commission should play a stronger role in ensuring that National Regulators in the 15 Member States implement EU legislation consistently and that the European Commission should have back stop veto powers as proposed in Article 6 of the Communications Framework Directive.

Rec 15.   Removing/ preventing regulatory barriers to investment

In addition to ensuring a stable regulatory environment to encourage Broadband investment, Government needs to remove a range of regulatory barriers to Broadband rollout and avoid creating new barriers. In particular, these include planning and licensing restrictions, building regulations and content and data protection issues.

There is a clear need for a coordinated and consistent approach to the implementation of devolved powers, such as planning across the United Kingdom. In particular, rural areas and remote communities, which could have the most to benefit from Broadband, could be most affected by stringent planning requirements that restrict the deployment of radio based infrastructures (such as masts and antennas) in these areas.

Recommendations

Rec 15.1   Planning issues – radio infrastructure

Public concerns about the siting of radio masts need to be addressed coherently by both planning authorities and industry across the UK in order not to delay the rollout of radio based Broadband services such as 3G and BBFWA. New planning regimes being introduced in Scotland and Northern Ireland have increased the fragmentation of the UK planning system, which will delay rollout of radio based Broadband infrastructures in these areas. Operators will be faced with much more uncertainty resulting in additional costs and delays. Ultimately, the rollout of 3G and BBFWA will take longer compared to the rest of the UK.

- The planning process across the whole of the UK should be operated in accordance with best practice guidelines, which recommend that 80% of all planning applications should be dealt with within 8 weeks. Meanwhile industry will continue to work according to best practice standards to enable public concerns about the siting of radio masts to be addressed.

Rec 15.2   Planning issues – satellite infrastructure

UK planning regulations for satellite dish deployment effectively restrict a residential property to a single antenna (a second dish can only be deployed with planning permission). If the first antenna is used for receiving digital television, this prevents a second antenna from being provided for any other service.

- Government should work with industry to review current planning regulations to determine how these restrictions could be relaxed while continuing to minimise the environmental/ visual impact of residential satellite terminals.

- Consumers should be able to choose between one 90cm dish (as allowed under current regulations) and two small dishes with an aggregate surface area equal to the larger dish. Best practice standards for the installation of terminals should be encouraged and implemented across the UK. The Confederation of Aerial Industries is ready to work with the government on this objective.

Rec 15.3   Levies on street works

Several local authorities have suggested imposing levies on street works (beyond charges currently imposed for works that overrun) and pilot projects have been announced in Camden and Middlesborough. This is a serious concern as such charges, which amount to an additional local tax on infrastructure investment, will impose significant additional costs on companies upgrading or rolling out new infrastructure. These costs would have to be passed on to the consumer and in some cases could deter investment.

- Government should recognise the negative effect that lane rental schemes will have on Broadband deployment. Meanwhile, other activities such as the existing scheme for fining companies who unreasonably prolong street works, and joint activity by the communications industry to develop common frameworks for facility sharing may have a significant impact on the Government's congestion objectives if given time to work.

- Given the perceived absence of a 'joined up' approach to the congestion issue, we also recommend that the Government initiates a major new spatial development exercise to determine how Broadband networks can contribute to Government's congestion objectives in

the longer term. The Streetwise campaign, launched by the National Joint Utilities Group, represents a significant initiative on the part of business to develop practical solutions to the problems associated with street works.

Rec 15.4   Satellite licensing requirements

The current licensing regime for satellite terminals in the UK (CEPT ERC Decision (00) 05) requires that all terminals with a transmit capability are notified and approved by the RA. These requirements cause substantial delay and add significant administrative cots and are no longer appropriate for the new generation of small low power transmission terminals that would be used to provide a Broadband satellite return path. Individual licensing is not appropriate for products designed to meet a mass market and would add unnecessary cost to the provision of Broadband satellite services that would need to be passed on to the consumer. This will be particularly significant for rural areas.

- The Radiocommunications Agency must work closely with industry to understand the needs of new satellite services and find more appropriate methods of licensing and regulation. Many of these issues are being discussed in the ad hoc Spectrum Pricing Committee, however, more needs to be done to ensure full industry participation in these meetings.

Rec 15.5   Building regulations – to mandate cable ducting

Building regulations could be amended to include requirements to install cable ducting in all new buildings and renovations. This would reduce the time and cost of installing communications equipment on customers premises, without restricting the choice of services/ bandwidth available.

- Government should consult with the building industry, Broadband service providers and the Confederation of Aerial Installers (CAI) in order to identify the best approach. The building industry may prefer a voluntary scheme to mandatory requirements. It may be useful to look at how other EU Member States have addressed this issue. Duct sharing does raise some liability issues which would need to be addressed (for example, if one operator damages the fibre of another whilst undertaking maintenance). This could be done through self-regulation.

Rec 15.6   MPT 1570

Unilateral action by the UK to develop non-harmonised emission limit standards for DSL equipment has had significant cost implications for equipment manufacturers. Interference issues should be addressed at European level in order to develop harmonised solutions. Unilateral action on the part of the UK has encouraged further non-harmonised initiatives by other Member States leading to additional cost barriers for equipment manufacturers. Inappropriate application of the MPT 1570 enforcement standard could restrict the availability of DSL services in some areas.

- Government must ensure that the application of MPT 1570 strikes an appropriate balance between the need to offer adequate protection to radio services whilst avoiding undue constraints on the roll out of DSL services, including future VDSL services.

Rec 15.7   <u>Internet Regulation</u>

Broadband promises to deliver much greater choice to the consumer in terms of the services, applications and content available (much of which will originate from outside the UK). However, greater choice brings with it greater responsibility on the part of the user, which is not necessarily widely understood. The Communications White Paper left the distinction between the internet and broadcasting dangerously vague. There is a danger that, intentionally or otherwise, Internet services may be drawn into broadcasting rules such as quotas and watersheds.

Lack of clarity about the role of regulators (Oftel, ITC and in the future OFCOM) in relation to the internet is damaging to the perception of the UK as a location of choice for basing on-line business. Given the country of origin basis of the e-commerce directive, a services supplier would be unlikely to chose to base its operations in the only Member State with a putative content regulator. Given the UK's strength in content and applications development this would be extremely damaging for the UK economy.

- OFCOM should not police internet delivered content. Issues related to illegal material should remain a matter for law enforcement agencies. (ISPs, which function as 'mere conduits' currently cooperate with law enforcement agencies on the basis of notification and take down to remove illegal material found on their servers). Meanwhile, the Government and industry must engage in a deeper dialogue with the public about this fundamental change of roles in terms of the regulation of content.

Rec 15.8   <u>Data Retention and Data Protection</u>

Communications data (for example, billing data) is an essential resource for law enforcement agencies, and many communication service providers (CSPs) co-operate with agencies under an agreed, legal framework according to the requirements placed upon them. As part of this arrangement, there exist mechanisms for communication service providers to recover operational costs.

As operators move progressively from PSTN to Internet Protocol-based networks, the nature and catagories of data retained for normal business practices will change, and no doubt vary between different operators. Crucially, new forms of data - distinct from that currently retained under PSTN - may not meet the needs of law enforcement agencies, such that it may become necessary for CSPs to establish the capability to collect and retain data that otherwise would not be necessary in the normal course of business. Depending on the nature and categories of data agencies will require to be retained, and for how long, gives rise to potentially significant cost issues for CSPs, as well as other concerns relating to data integrity and legal liability.

- In order not to undermine the competitiveness of the communications sector, CSPs require timely and extensive consultation and cooperation with appropriate Government agencies regarding future specific data retention requirements and related liabilities. In addition, CSPs require from Government a commitment to meet in full at least all operational costs.

Rec 15.9   <u>Cross border data protection issues</u>

The different approach taken to the implementation of EU data protection directives in the 15 Member States has made it difficult to provide simple narrow band communications services, such as CLI (caller line identification) cross border. These issues need to be resolved to ensure that barriers are not put in the way of the provision of new cross border Broadband services. This

is particularly important as business travellers are likely to be early adopters of Broadband technology and represent a significant high value market for Broadband services and applications.

- The UK government must ensure full implementation of the revised Communications Data Protection Directive and encourage other Member States not to hinder the development and provision of Broadband services cross border.

5.   MEASURING SUCCESS – KEY METRICS

When dealing with any complicated, dynamic environment, measuring performance is never easy. Such a difficulty is compounded when dealing with a market as immature as Broadband. There are two reasons for this: First, a lack of understanding of how performance should be measured – what will constitute success? And second, once measurements have been made – how will they be interpreted?

The underlying principles used to develop a set of indices must be:
- *Simple* – the index must be transparent and easy to explain and understand
- *Quantifiable* – the data to be used in the index must exist in a consistent manner across all countries
- *Realistic* – it should give as realistic an impression as possible as to the status of Broadband in a given country.

In these situations it is sensible to start from an end goal and work backwards. In the UK's case, the goal is to have the most extensive and competitive Broadband market in the G7 by 2005. Therefore, extensiveness and competitiveness are clearly the two criteria that will need to be measured. These words do not naturally lend themselves to measurement and are intrinsically subjective.

In July a contract was awarded by the Office of the e-Envoy to Analysys Consulting to collect international Broadband market data and benchmark the UK against leading Broadband nations. Since July the Broadband research group has worked with Analysys to agree quantifiable measures of success for the Broadband strategy, to collect the data and to present the results. Consensus has emerged around a dashboard of 6 indicators. A range of indicators enables a deeper understanding of the relative strengths and weaknesses of each international market that is simply not possible to attain from a single aggregated measure. A further advantage is that causes (e.g. regulation, competition) can be separated from effects (e.g. price and take-up) and analysed independently.

This section presents definitions for each dashboard indicator and the rankings for G7 countries (the detailed data underlying each measure is set out in Appendix 1). Next the relationship between each indicator and the government's 2005 target is presented. Finally, recommendations are made for future benchmarking activities. Note: All indices are based on figures for August 2001.

The Performance Dashboard
Six key measures of success have been identified: Price, Choice, Regulation, Availability, addressable market and Take-up. These computed as standardized indices (i.e. numbers between 0 and 1, where 0 represents poorest performance and 1 represents best performance). The definitions of these indices are as follows:

Broadband Price
The Broadband price index is computed as the weighted average price across the full range of packages available in a given country– where price is weighted by service availability (population coverage). Price is adjusted to purchasing power parity in order to minimise the impact of exchange rate fluctuations when comparing time series data. Based on this measure the UK is in sixth place in the G7.

Rank	Country	Price index
1	Canada	0.93
2	Japan	0.86
3	France	0.86
4	Germany	0.74
5	USA	0.72
6	UK	0.63
7	Italy	0.44

Figure 17: Broadband price index

Broadband Choice

The Broadband choice index measures both retail and technology choice. It is computed by combining 3 equally weighted components:

- The Market Concentration Index: measured as the sum of the squares of the market shares of the top three facilities based providers. This represents both retail and infrastructure competition.
- Infrastructure Competition: The sum of the population coverage of the facilities based providers. This is an indicator of technology competition.
- Retail Competition: the number of providers with a market share greater than 5%.
-

The results of the choice index are shown below. The UK was in fourth place in the G7 in August 2001.

Rank	Country	Choice index
1	USA	0.85
2	Japan	0.74
3	Canada	0.61
4	UK	0.53
5	France	0.38
6	Germany	0.34
7	Italy	0.28

Figure 18: Broadband Choice index

Broadband Regulation

The regulation index compares and contrasts the Broadband market actions taken by regulators in each country. The regulation index is based on simple, binary scores for the presence (or absence) of regulatory provision for:

- Wholesale DSL
- Wholesale Cable

- Local Loop Unbundling – Mandated?
- Local Loop Unbundling – Effective?
- Access upstream of MDF
- Linesharing
- Separation of Network Ownership

With all factors equally weighted the UK was in third place in the G7 in August 2001.

Rank	Country	Regulation index
1	USA	1.00
2	Canada	0.75
3	UK	0.75
4	Japan	0.50
5	France	0.25
6	Germany	0.25
7	Italy	0.25

Figure 19: Broadband Regulation Index

Broadband Availability
Broadband availability is measured as a percentage of the population with access to affordable, mass-market services only. The UK was in sixth place in the G7 on Broadband availability in August 2001.

Rank	Country	Availability index
1	Germany	0.95
2	Canada	0.84
3	Italy	0.84
4	Japan	0.84
5	USA	0.68
6	UK	0.66
7	France	0.63

Figure 20: Broadband Availability Index

Broadband Addressable Market
Those consumers who are currently on flat rate Internet access packages, higher speed digital packages and consumers with iDTVs (a platform for Broadband service delivery) represent an addressable market for Broadband service providers. These consumers are 'half way' to adopting Broadband because their current access packages share common product features with Broadband. They might reasonably be expected to rapidly adopt Broadband given price changes or new applications development. As such addressable market is a leading indicator of Broadband market extensiveness and take-up. It is defined as the standardised penetration levels for flat rate packages, ISDN and DTV. The UK was ranked third in the G7 on addressable market in August 2001.

Rank	Country	Addressable Market index
1	USA	1.00
2	Japan	0.93
3	UK	0.89
4	Canada	0.70
5	Italy	0.43
6	France	0.38
7	Germany	0.36

Figure 21: Broadband Addressable Market Index

Broadband Take-up

Broadband take-up is measured as a percentage of the population renting Broadband services. The UK was seventh in the G7 for Broadband take-up in August 2001.

Rank	Country	Take-up index
1	Canada	0.28
2	USA	0.16
3	Germany	0.07
4	Japan	0.05
5	France	0.05
6	Italy	0.02
7	UK	0.01

Figure 23: Broadband Take-up Index

The 2005 Target – Competitiveness and Extensiveness

The government target is to have the most competitive and extensive Broadband network by 2005. The target may therefore be broken down into the two factors – competitiveness and extensiveness – which combine to provide the overall market environment for Broadband. We can define these two factors in terms of the relevant dashboard indicators as follows:

- *Competitiveness* is defined as a composite measure of the market regulation index (a leading indicator), market choice, and price (a lagging indicator). These are all weighted equally.
- *Extensiveness* is defined as a composite measure of addressable market (a leading indicator) and Broadband availability. These are weighted equally.

    The UK was in fourth place and fifth place respectively on the competitiveness and extensiveness rankings in August 2001.

Rank	Country	Competitiveness index	Rank	Country	Extensiveness index
1	USA	0.82	1	Japan	0.87
2	Canada	0.77	2	Canada	0.82
3	Japan	0.76	3	USA	0.79
4	UK	0.61	4	Germany	0.75
5	France	0.57	5	UK	0.74
6	Germany	0.50	6	Italy	0.70
7	Italy	0.34	7	France	0.55

Figure 23: Broadband Competitiveness and Extensiveness Index

While developing the measures of success it was agreed that there are a number of areas where data is not currently available that should be considered for future international comparisons:

- *Quality of Service*: a programme of objective measurement of quality of service, as perceived by customers, should be established. This would require direct measurement of end to end performance at various times of day, for each package/provider, to a defined series of benchmark services. The model was felt to be Oftel's monitoring programme of the various cellular networks. The very high contention ratios used on a variety of 'Broadband' platforms and in various countries, meant that services, in principle offering Broadband rates, sometimes offered end-to-end performance little better than narrowband during peak periods. In practice it would be impossible to construct an objective quality of service index simply from data submitted on contention ratios at the various stages of the communications chain – direct measurement is required.

- *Demand Side Input*: more primary input is essential from current and potential users.

6. NEXT STEPS

As requested in UK Online: the Broadband Future, the BSG's remit after submission of these initial recommendations will be to keep the strategy under regular review offering recommendations to government on how it should be updated on a six monthly basis. In particular:

- The BSG looks forward to the government's response to this report and will work together with the DTI and the Office of the e-Envoy to develop a road map to achieve the BSG's vision for Broadband Britain

- Broadband is a nascent and unpredictable market. We see this report as an important first step in addressing the barriers and opportunities presented by broadband

- As the market develops the barriers and opportunities may well change. The BSG will therefore continue to review these issues and evaluate the UK's progress

- In particular the BSG has been struck by the lack of consumer based market research on the barriers to and drivers of Broadband take-up, and would encourage further research in this area. Ideas developed recently by iSociety on possible micro-barriers to Broadband should be developed further

- The BSG will seek to work with government departments and local administrations to see how they can maximise the benefits of Broadband

- Further work is also required to identify practical ways to take the development of Broadband content forward. The summit on Broadband content planned for 3 December 2001 will be useful in this regard

Comments on this final report can be sent by e-mail to the BSG care of: awalker@fei.org.uk

http://www.e-envoy.gov.uk/ecommerce/broadband/index.htm